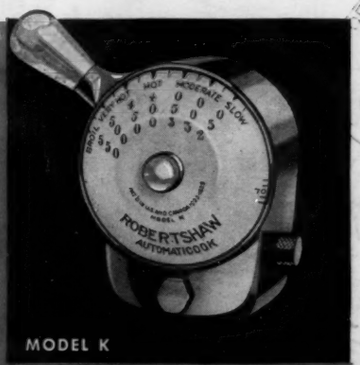
WESTERN GAS

September 1932

20 Cents the Copy

ROBERTSHAW



MODEL K

The major essential for correct OVEN PERFORMANCE

MODEL F

SEP 19 1932

"AutomatiCook"

WOMEN are giving more attention to cooking economy than ever before. And many a woman, doing her own cooking once more, suddenly realizes just how old and inadequate her range has become.

If she is going to prepare her own meals, she rightfully feels that she is entitled to a modern range that will save time, labor and money for her.

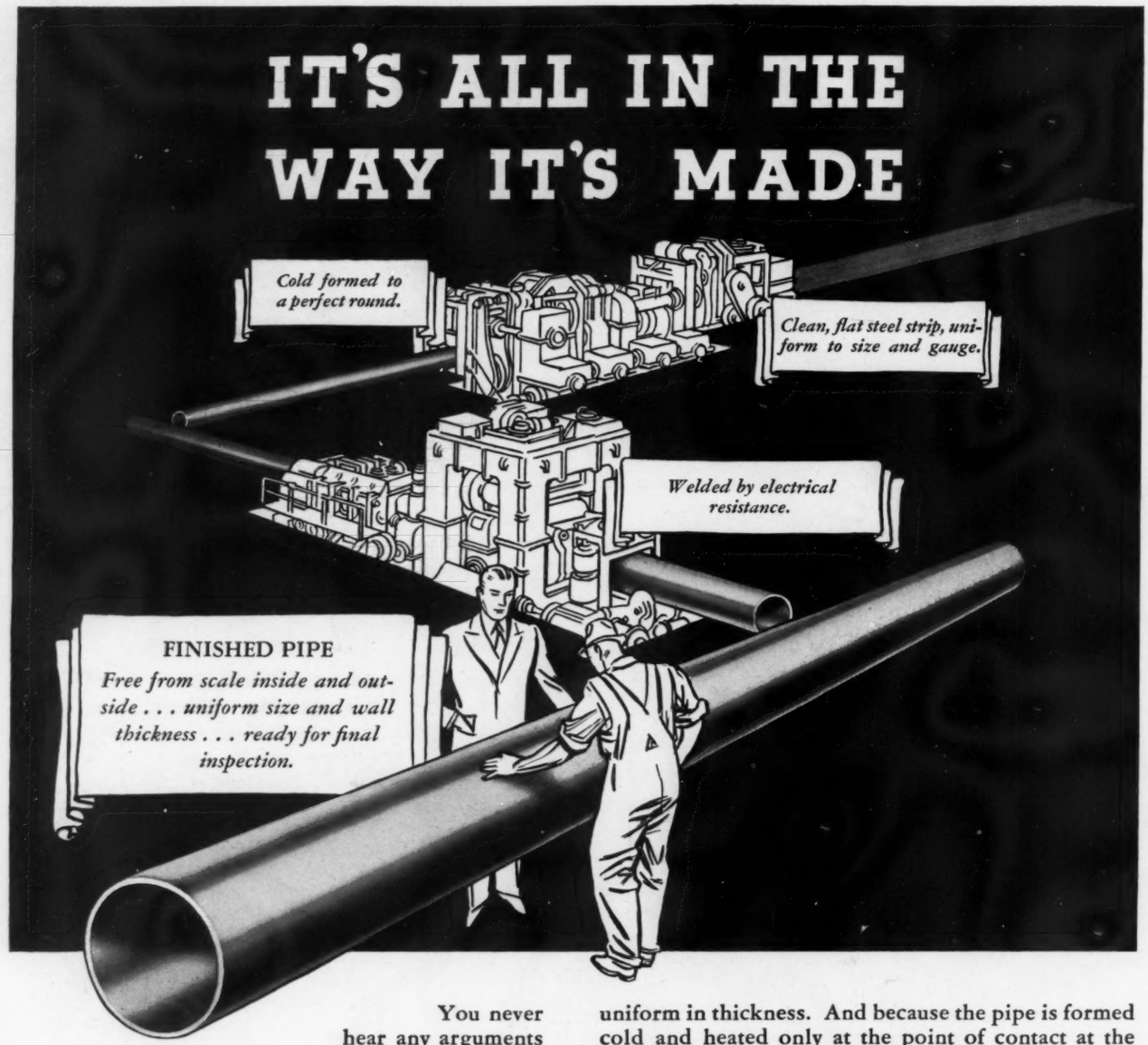
Needless to say, that means a range with a Robertshaw—the oven control that she not only knows most about but the control in which she has complete faith. No price inducement is greater in her mind than genuine freedom from kitchen drudgery.

Important as the Robertshaw has been in creating new range sales in the past, it becomes doubly important when the woman who buys a range expects to use it herself. Be sure that your range department is thoroughly organized to show the advantages of the Robertshaw to every range prospect. Are you using the Robertshaw Lithographed Display? It's free—and a word by letter will bring it promptly.

Robertshaw Thermostat Co.
YOUNGWOOD, PENNA.

A MONTHLY JOURNAL DEVOTED TO THE WESTERN GAS & APPLIANCE INDUSTRIES

IT'S ALL IN THE WAY IT'S MADE


Cold formed to a perfect round.
Clean, flat steel strip, uniform to size and gauge.
Welded by electrical resistance.
FINISHED PIPE
Free from scale inside and outside . . . uniform size and wall thickness . . . ready for final inspection.

You never hear any arguments about how uniform the wall of Republic Electric Weld Pipe is—or how round it is—or how clean. And it's all because of the way it's made.

Flat strip steel rolled to uniform thickness is formed cold to a perfect round. This is the only process which insures the inside surface of the pipe being exactly the same as the surface of the strip from which it is formed. Then the edges under pressure are welded by the electrical resistance method—Johnson patents owned by Republic. Because the steel strip is not heated it forms no scale—the finished pipe is clean inside and outside. Because the strip is of uniform gauge the wall of the pipe is absolutely uniform in thickness. And because the pipe is formed cold and heated only at the point of contact at the weld, its original roundness is never distorted.

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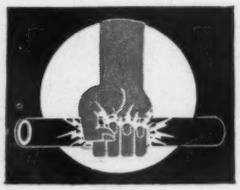

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The dots on this map show some of the hundreds of places where we have installed FLUOR COOLING TOWERS.

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A special bulletin will be sent free upon request.

. . . rapid progress . . . the most important factor in the economical laying of any pipe line, is assured by the use of Dayton Couplings.

Slip it on the pipe, tighten bolts with the only tool needed—a ratchet wrench—and the section is ready for service.

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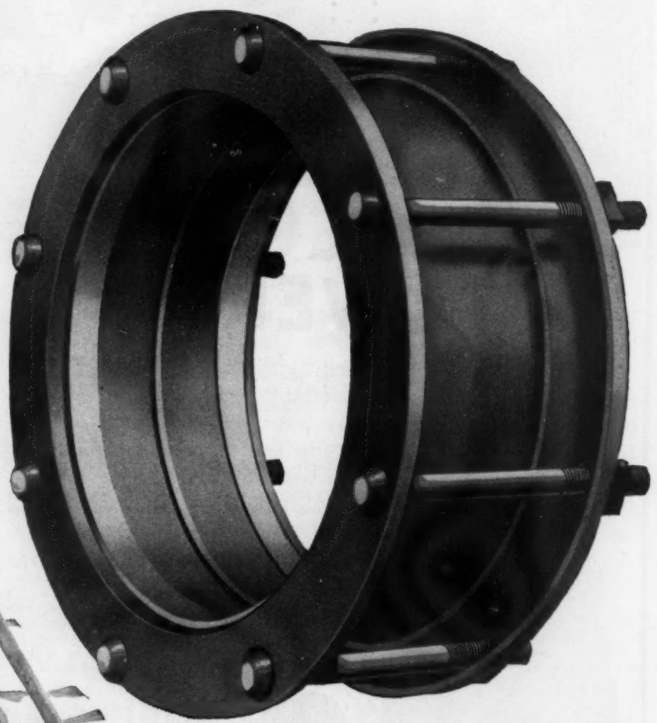
DAYTON, OHIO



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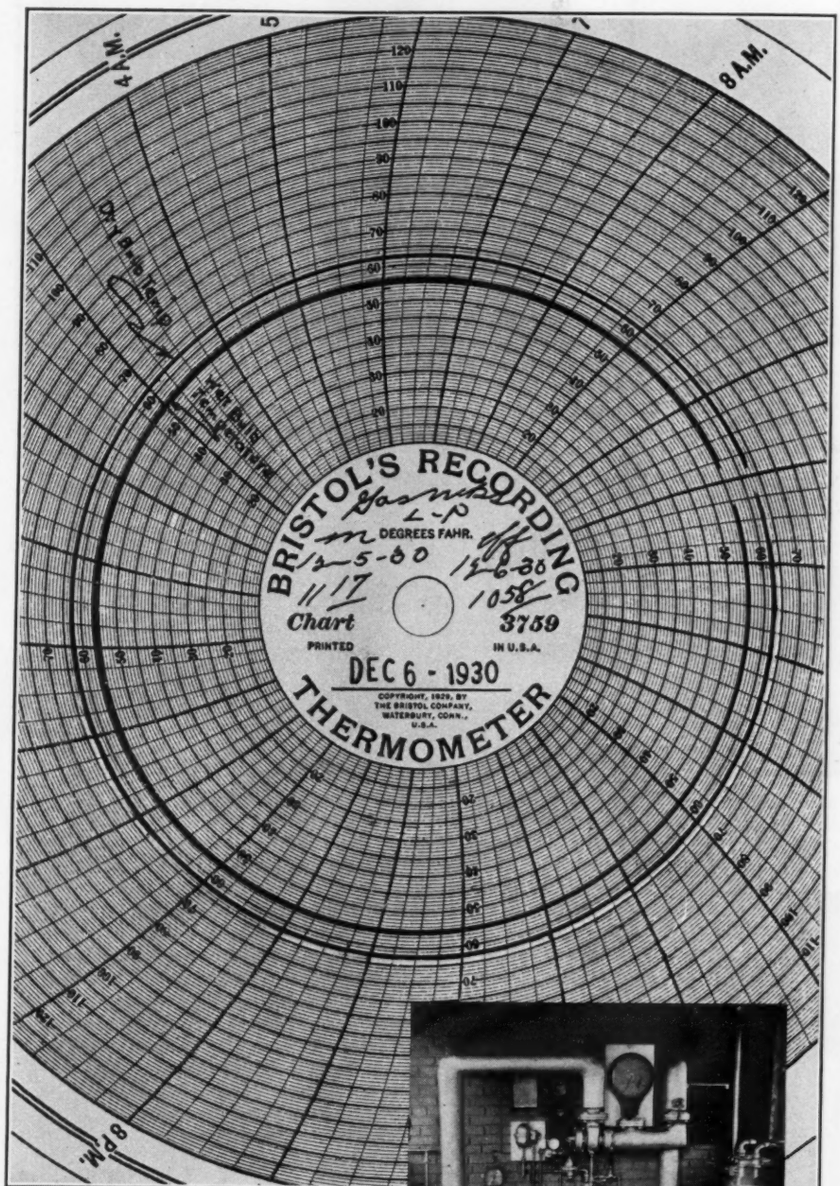
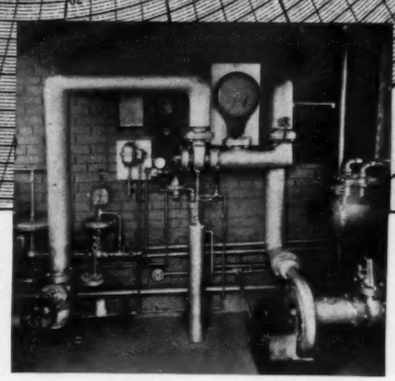
Another **BRISTOL** achievement!

..controlling humidity automatically in the saturation of natural gas..





Reproduction of part of a BRISTOL'S 12 inch diameter chart recording wet and dry bulb temperatures for an actual saturation control system, revealing the close control which is automatically accomplished. Wet bulb temperature pen is set 5° F. low to prevent the two records from running together. RIGHT: BRISTOL'S Automatic Saturation Control System.

IF dry natural gas is transmitted through mains originally built for the distribution of manufactured gas, trouble invariably is experienced. Pipe connections dry out. Joints leak. Unaccounted-for-losses increase.

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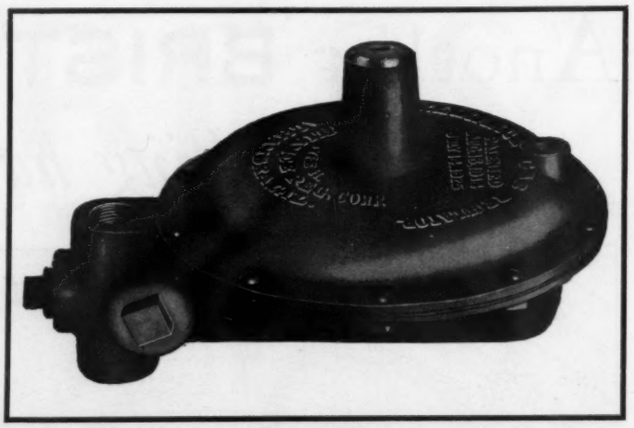
At the OLYMPIC VILLAGE *uniform* gas pressure was provided by ninety-four . . .



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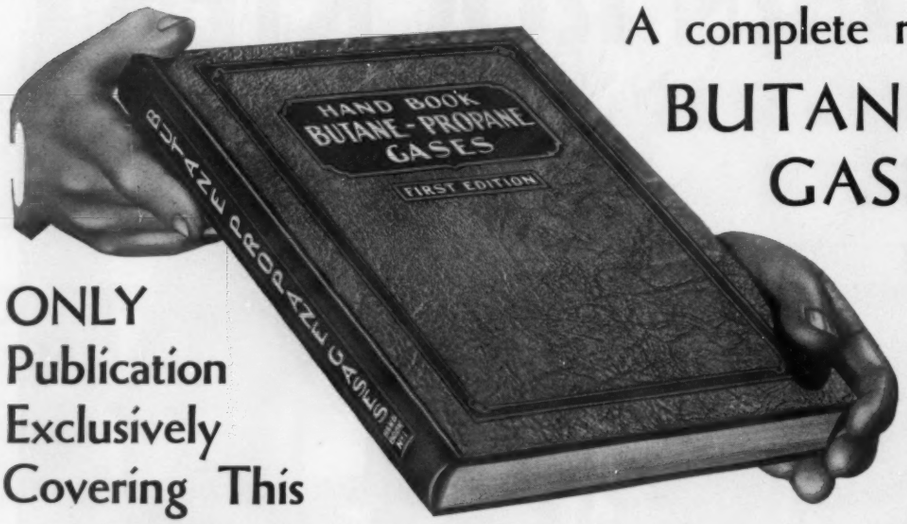

ONLY Publication Exclusively Covering This Field

THIS Handbook comes in response to a very definite need. A tremendous amount of development work has been accomplished for the liquefied petroleum gas industry in a brief space of time, with many companies participating. And to date there has been no one source to which the industry could go for information on all phases of the field. This is the mission of the *Handbook of Butane-Propane Gases*—consolidating and organizing all of these reference data under one cover.

The editors have established close contact with all branches of the liquefied gas industry—production, bottled gas and town plant distribution, gas enrichment—and to assure a high standard of technical excellence for the Handbook leading figures in the industry have extended their cooperation as contributors.

In the next column contents of the *Handbook of Butane-Propane Gases* are reviewed. No phase of the field is neglected, and every major subject heading is treated in detail, making the Handbook an outstanding reference work. Numerous tables, charts and illustrations add to its value.

Advance orders for the Handbook have poured in from all sections of the United States, and from several foreign countries, since the first announcement of its compilation—indicating again the need for this publication and the growing interest in butane-propane service. A limited printing makes it imperative that you place your order now (send no money). Use the coupon below.

INTRODUCTORY: (a) History: Highlights in development of bottled gas, central plant, industrial, and enrichment usage. (b) Present and potential scope of the industry: Statistics on marketed production; available supply; number of central plants, bottled gas distributors, producers; number of gas companies enriching; future field of expansion for bottled gas and central plant service, as well as other forms of liquid gas utilization. **PHYSICAL PROPERTIES:** Vapor pressure curves and tables; tables of constants for hydro-carbon series; proportioning curves, etc. A section made up of basic reference data, with liberal use of curves and charts. **PRODUCTION OF LIQUEFIED PETROLEUM GASES:** Sources for liquefied petroleum gases; the natural gasoline extraction process; refinery gases; dehydration; mixes for gas enrichment, industrial plants, bottled gas, and town plant use under various temperature conditions. **SAFETY REQUIREMENTS:** Presenting in convenient reference form pertinent regulations of the Bureau of Explosives, Underwriters' Laboratories, Compressed Gas Manufacturers Association, National Fire Protection Association; approved field practices for handling, storage, etc.; design of containers. **TRANSPORTATION:** By tank car, motor truck, pipe line, water; design of transportation equipment; traffic requirements; freight charges. **APPLIANCE UTILIZATION:** Appliance design and adjustment for operation on liquefied petroleum gases; combustion characteristics; fuel consumption of various types of appliances; appliance efficiencies on butane-propane, compared to other types of gas. **USE IN GAS MANUFACTURE:** Calculations in connection with use of propane and butane with manufactured gases; enrichment of manufactured gas transmitted under high pressure; use of propane and butane to meet peak loads; use of propane and butane as a substitute for gas oil for the carburetion of blue water gas; use of butane or propane for heating gas underfired coke ovens to reduce coke production. **CENTRAL PLANTS:** Design of plant and distribution system for both air-butane and undiluted vapor types; measurement and other operating problems; town survey; sales organization; rates and billing. **BOTTLED GAS DISTRIBUTION:** One-drum distribution; two-drum distribution; bulk stations; sales organization; rates and billing; utility cooperation on bottled gas sales; competitive fuels; combining central plant and bottled gas service; railway, marine and other special installations. **INDUSTRIAL USES:** Comparative costs of liquefied gases, coal, oil, manufactured and natural gas; description of plant lay-outs for industrial use of liquid gases; conversion problems in changing from other types of fuel to liquid gases; present and potential field for industrial use of these products; application of liquid gas to various industrial processes. **SPECIAL REFERENCE FEATURES:** (a) Directory of central plants, listing the towns served (with town population), date service began, type of service, type of distribution system. (b) Directory of bottled gas distributors. (c) Catalogue Section: Detailed specifications of equipment and appliances designed especially for this industry. (d) Index: Cross-referenced by subjects and authors. (e) Buyers' Guide: A commodity directory of appliances and equipment, with names and addresses of all manufacturers serving the industry.

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1882—1932

U.G.I.

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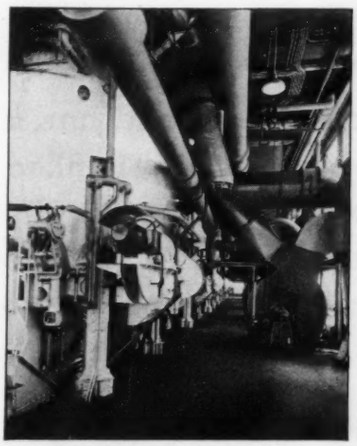

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Pioneers in the development of Apparatus and Processes for the most economical production of Manufactured Gas

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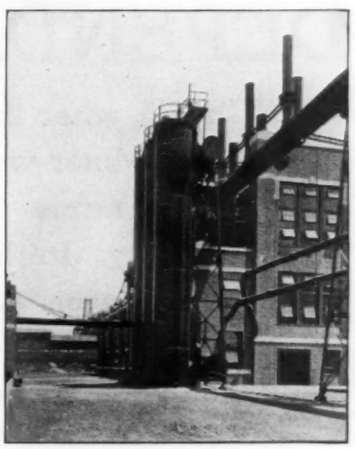

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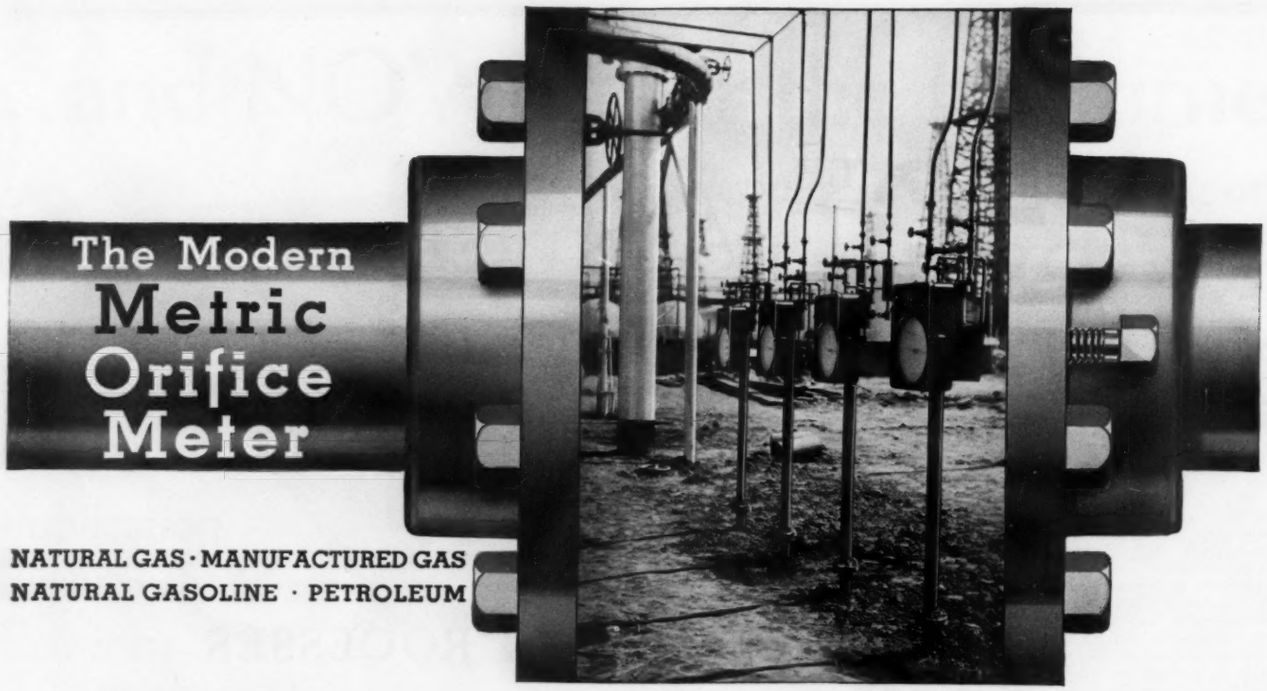

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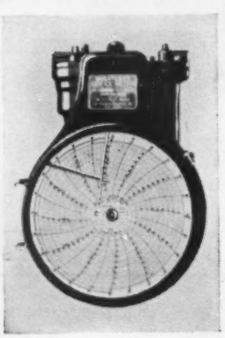

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AND

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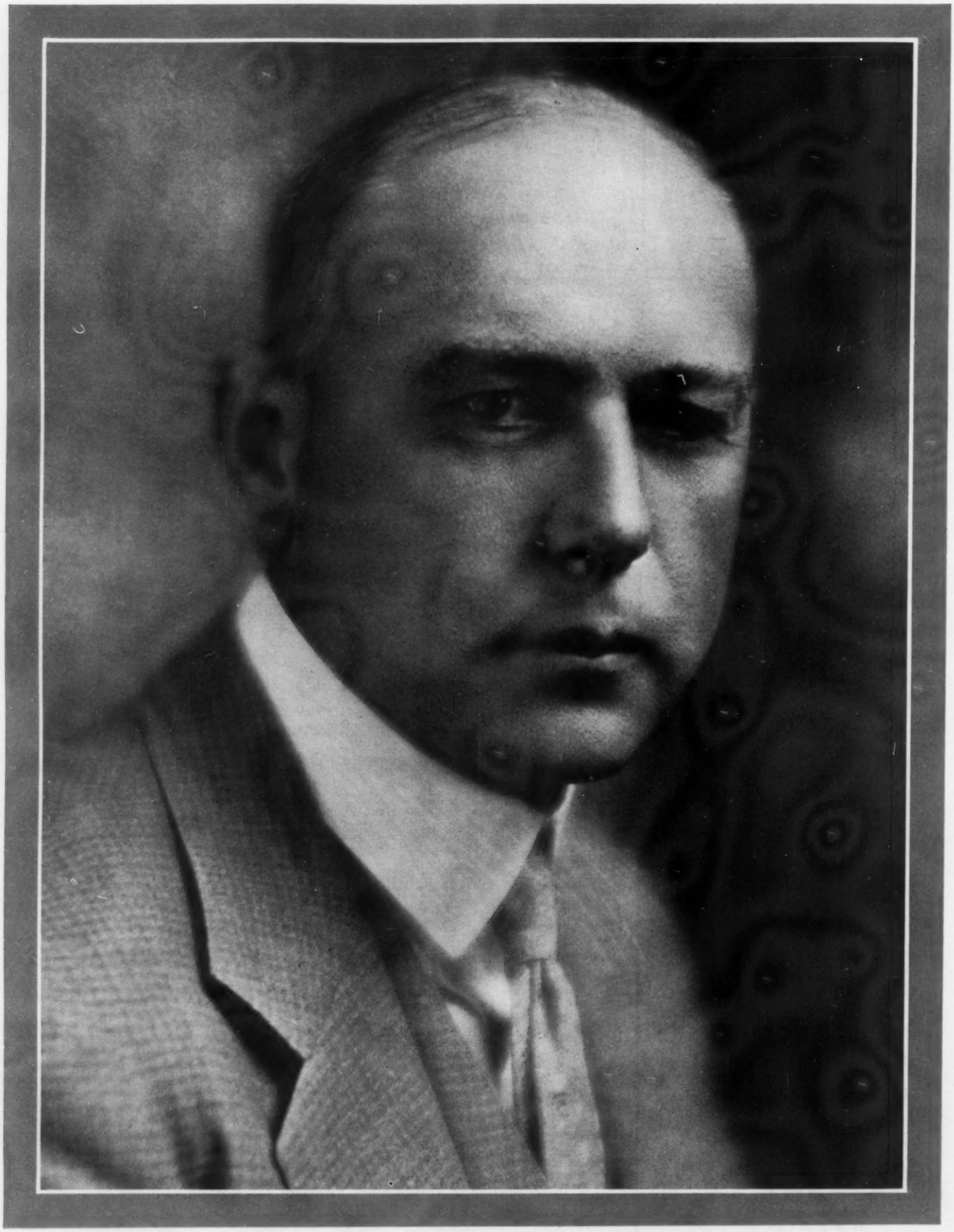

Named to the presidency of the Pacific Coast Gas Association during its 40th year, Harry L. Masser, vice-president and executive engineer of the Los Angeles Gas and Electric Corporation, enters office with a full background of utility and Association experience.

September, 1932

WESTERN GAS

Vol. VIII, No. 9

"Reg. U. S. Pat. Off."

A Monthly Journal of the Gas and Gas Appliance Industries in *Western America*

Reviewing *the* 39th Annual Pacific Coast Convention

By GEORGE H. FINLEY

Managing Editor, Western Gas

ROUNDING out its 39th year of service to the Pacific Coast gas industry at its Del Monte convention, August 24-25-26, the Pacific Coast Gas Association put a period to one of the most constructive years in its history.

Though the convention was originally scheduled for Spokane, Wash., the wisdom of relocating it at a more central point was seen in the creditable attendance of 350 which gathered at Del Monte for a convention program in every way remarkable for its excellence.

To suggest merely a few of the developments which made the 1932 convention a memorable one, there were: The outstanding address of President James L. Stone; the official introduction of a Manufacturers' Section into the Association fabric; the presence of two midwesterners, T. J. Strickler, head of the A.G.A. Natural Gas Department, who told of the real significance of anti-merchandising propaganda in his section, and Floyd Brown, vice-president of the Natural Gas Pipe Line Co. of America, who brought to the convention his seasoned estimate of the natural gas situation in the Middle West; the forceful presentation by Philip O. Deitsch of the near-at-hand national advertising program sponsored by the industry's courageous and far-sighted manufacturers; first-time award of the Addison B. Day Medal of Honor, to Frank Wills of the Pacific Gas and Electric Co.; the same company's contribution of an inspiring playlet, "The Blue Vase," which brought to sales departments the message that untiring effort will get results, even in the face of unforeseen obstacles. The list of convention headliners could well go on to include most of the general session addresses and many of the sectional papers.

Opening the convention Wednesday morning, President Stone called upon P. M. Downing, vice-president and general manager of the Pacific Gas and Electric Co., who welcomed the delegates to Del Monte. The convention's last visit to Del Monte was in 1929, and many of the same corps of convention arrangements committee workers served again this year, under the efficient direction of T. W. Snell, general chairman.

After Mr. Downing's welcoming address, President Stone turned the gavel to vice-president Harry L. Masser, and delivered the presidential address—always the occasion for a review of significant conditions within and without the industry. President Stone's comments upon competition in the ranks of general business as it relates to the utility structure, and his challenging plea for a determined stand against electric range inroads, were the high lights of the opening session; his address is published at another point in this issue.

1932-33 Officers

Election of officers on the opening day brought a new administration into being, headed by Harry L. Masser, president, and George P. Egleston, vice-president. By unanimous selection the convention installed the following:

President: Harry L. Masser, vice-president and executive engineer, Los Angeles Gas and Electric Corp.

Vice-President: George P. Egleston, general manager and treasurer, H. R. Basford Co.

Treasurer: D. G. Martin, auditor, Pacific Gas and Electric Co.

Directors:

Andrew L. Kerr, president, Steiger & Kerr Stove & Foundry Co.

C. H. Potter, commercial manager, Southern Counties Gas Co.

Don C. Ray, manager public relations, Pacific Gas and Electric Co.

H. M. Thomas, general manager, Northwest Cities Gas Co.

Completing the board of directors are past-president James L. Stone and the following directors holding over from last year's board:

F. M. Banks, general superintendent of sales, Southern California Gas Co.

A. E. Holloway, vice-president in charge of sales, San Diego Consolidated Gas and Electric Co.

W. C. Hornberger, vice-president and general manager, Arizona Edison Co.

J. B. Wilson, president, Coast Counties Gas and Electric Co.

Section leadership for the coming year brings to office the following general chairmen:

Accounting Section: R. N. Dreiman, treasurer, Pacific Public Service Co.

Commercial Section: Forrest U. Naylor, manager gas sales, Pacific Gas and Electric Co.

Manufacturers' Section: R. L. Hinckley, president, General Water Heater Corp.

Publicity and Advertising Section: F. H. Holden, supervisor advertising and publicity, Southern California Gas Co.

Public Relations Section: D. L. Scott, manager public relations, Los Angeles Gas and Electric Corp.

Technical Section: Guy Corfield, chemist, Los Angeles Gas and Electric Corp.

Amendment of constitution and by-laws to officially establish the Manufacturers' Section within the Association was effected at the convention's first session, bringing formal recognition of the large place occupied by appliance and equipment men in the industry. The Section already has a nucleus of 61 in its membership, made up of 28 manufacturers with factories on the Pacific Coast, and 33 eastern manufacturers strongly represented on the Pacific Coast. Its purposes were outlined for the convention by R. L. Hinckley, Section chairman.

The report of the Board of Directors, read by Clifford Johnstone, managing director, summarized the year with the industry and pointed to sound conditions obtaining in sales, revenues, and number of customers, together with maintenance of Association service through undiminished committee work, cooperative advertising, and in other channels.

With the exception of the address by John P. Coghlan the second general session program, Wednesday afternoon, was devoted to manufacturers' activities and trade relations. Mr. Coghlan, second vice-president of the P. G. and E., under the head of "The Public and the Public Utilities" made a searching analysis of present criticism levied against the industry, and suggested directions in which action is called for to counteract effects of such criticism.

Appearing on the Wednesday afternoon program, Philip O. Deitsch, manager of Manufacturers group activities for the American Gas Association, brought an inspiring forecast of the coming national advertising to be initiated by the industry's manufacturers. Mr. Deitsch's presentation covered the course of development of the national advertising project, and went briefly into the range campaign which will be launched shortly, dealing with media to be used, type of copy appeal, and other factors. He was recalled to the convention program to present further information at the Thursday morning session, and the Association went on record in formal resolution as heartily endorsing the constructive program which the manufacturers are about to conduct for the industry, as outlined by Mr. Deitsch.

One of the most important messages brought the convention was that from Major T. J. Strickler, vice-president and general manager of the Kansas City Gas Co. and head of the A. G. A. Natural Gas Department. Speaking to the topic "The Merchandising Situation in the Mid-West" Major Strickler introduced unmistakable evidence to prove that municipal ownership motives lie behind the agitation which resulted in anti-merchandising statutes in Kansas and Oklahoma, and which seeks to precipitate similar legislative curbs in many other states.

As a fitting follow-up to Mr. Strickler's account of Mid-West conditions, F. M. Banks presented a discussion of "Trade Relations in the Gas and Electric Industries." As chairman of the Joint Trade Relations Committee of the Pacific Coast Gas Association and the Pacific Coast Electrical Association, he reported on progress made in the program for more effectively coordinating utility-dealer interests throughout the Pacific Coast area.

R. A. Hornby, executive engineer of the Pacific Lighting Corp., in his paper on the subject of pension and benefit plans, made a thorough analysis of basic objectives for such plans and discussed the characteristics of funding involved in pension and benefit undertakings. He urged most strongly that due consideration be given at the outset of such plans to insure their solvency by complete funding of all benefits involved.

One evening of the convention was given over to a general session featuring an address by R. E. Fisher, vice-president in charge of public relations and sales for the Pacific Gas and Electric Co., and a playlet, "The Go-Getter". presented by the sales department of the P. G. and E., under the direction of Frank Bevan. Opening this Thursday

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Challenging Problems *on* Today's Horizon

By JAMES L. STONE

1931-32 President, Pacific Coast Gas Association; Vice-President and General Manager, Spokane Gas and Fuel Company

IF the economic consequences of excessive competition and excessive fluctuations from profit to loss which today demoralize nearly all private business, are once understood by the people, they will understand that attacks on public utilities with their stabilization both of profit and of employment are really attacks upon a type of business organization which, when fully developed, may bring about the perpetual maintenance of American prosperity. In other words, the economic problem of stabilized prosperity for all is in a large part solved in the public utility. The public must turn its attention to some similar solution for private business.

Unproductive Competition

I do not mean to suggest that all business should be put under State control as we are. This works with us because we are relatively small units, each operating in a restricted area. With us, facts regarding markets, investments, operating costs, etc., are possible of close approximation and the rate-making function is therefore relatively simple. The same system applied to the railroads by the federal government has not been so successful because of the great size of the units involved, because of competition between those units, and because of the many extraneous problems which enter into the rate studies by reason of geography and the vast number of commodities over which rates must be spread, each with a variation in its ability to pay. Such difficulties would be multiplied a hundred fold in the regulation of highly competitive industry with its national and local units all competing in the same markets and each with its individual variation of the general commodity. No, the message which we have for general business is not "Go thou and do likewise." Our message is, "Unrestricted competition within an industry is the death of trade." Up to a certain point, competition between units of an industry stimulates invention, quickens efforts, improves products and partially, at least, controls prices. There comes a time, however, in every industry when productive capacity has been built equal to the normal demand for the product. Competition causes local units to seek business nationally, new markets and uses are sought and perhaps found, more productive capacity built, and, in general, business acquired by an expensive forcing method ending always in price cutting, idle or semi-idle factories, restricted earnings and buying power of employees, and ultimately total loss of business and investment to some and restricted profits to all. Human relations are "out of kilter!"

Let us hope, therefore, that out of our present adversity there will come legislation which will permit of adequate in-

dustry planning. In the last analysis, government and business are not ends in themselves, they are merely machines to promote human well-being. The function of government is to protect individual rights, and the function of business is to provide the means by which we live. Our legislators and our business leaders have before them a golden opportunity to synchronize their machines and pull civilization over the hump into a new era in which human relations will be right because nothing else will matter.

Each industry, if not unduly fettered by anti-trust laws, can become self-controlled, and can establish its own self-governing regulations which will permit industry planning, and a control of the destructive tendencies of excessive competition. This is the true path out of the impasse in which we are now halted.

Protect Basic Load

I cannot let this opportunity go by without calling attention and emphasizing to the members of this Association the need of some definite and aggressive program to overcome the inroads that the electric range, without substantial justification, is making on the gas cooking load.

I appreciate the fact that this invasion on what many companies term their "bread and butter business" has not been as severe in some communities as it has in others and, because of this, my plea for definite action with a well conceived program will not get the universal sympathy I think it deserves.

There are, however, many properties where the loss of business to this economically unsound invasion has already reached substantial proportions, and it continues with increasing momentum. The managers of these properties would surely counsel that "an ounce of prevention is worth a pound of cure."

It cannot be too strongly emphasized that the adoption of a sound program at the beginning of the attack is far more valuable than any measure that can be taken, once the electric competition has gained a foothold. The battle is half won by taking the offensive. It is better to overwhelm the competition at the start than to try to stop its progress once inroads have been made.

If the threat of the electric range to our cooking load were based on economically sound reasons, or if it were due to a superior service, we might view the whole matter philosophically and say to ourselves, "This business is going. We must find new fields, if possible, to take its place the same as we did when electricity took away our valuable gas lighting load." If the manufacturers of electric ranges had outclassed the manufacturers of gas ranges and were making a more beautiful piece of equipment capable of giving a superior service at equal or better costs of equipment and operation, we might view this situation with alarm.

But nothing could be further from the truth. The gas range manufacturers have equalled, and in many cases excelled, the electric range manufacturers in beauty of design, in cost of equipment, in cost of operation, in convenience and cleanliness of operation, in flexibility, in speed, and in positive heat control.

IN a stirring valedictory address at Del Monte, Mr. Stone capped his efficient year of administration over P.C.G.A. affairs by directing the industry's attention to several trends in general business, and to certain problems within the industry, which are of current significance. Especially did he caution against an apathetic attitude toward encroachment of the electric range into fundamental domestic markets, placing the responsibility for future solution of this problem with the combination company. Selected portions of Mr. Stone's splendid message are printed in these pages.—EDITOR.

What, then, is causing this drift toward electric cooking? It is purely psychological, based on the false premise that it is more modern and fashionable. Unfortunately, economics is not a controlling factor in a fashion or style trend. Some of the most successful electric range and even electric water heater campaigns have been carried out in natural gas territories. In many of these natural gas territories, new apartment houses offer more than an equal opportunity for the electric range. We must face this issue fairly and squarely, recognizing that we have a competitor whose progress has been made in spite of its higher costs for service.

The principal reason for this fashion of preference for electricity over gas is the fact that electricity's use for cooking is more recent than that of gas. Thus, since it is the later product of man's inventiveness, people instinctively think of it as the better. As we all recognize, fashions are generally based on novelty. But electricity no longer has the novelty it once enjoyed. Therefore, the time is now at hand when this fashion of regarding electricity as the latest, and the best, can be combatted more easily than before. The fashion by which electricity benefits, and which electrical distributors promote in every way they can, is a national one; it cannot be opposed or its lack of reason exposed by scattered or isolated efforts. It can only be met by concerted action on the part of gas companies all over the country.

We should bear in mind that fashions have lately become the creation of business. Manufacturers of clothing, cosmetics, and of other commodities in nearly every field of business or service, themselves stimulate and control the fashion. It is up to us as salesmen of gas, by united national effort, to counteract the fashion of thinking of electricity as later and better than gas, and institute in its stead the fashion, as well as the straight truth, of thinking of gas as unsurpassable for cooking and water heating, as it undoubtedly is.

This is psychologically the time to enter upon such a campaign. Never before has the factor of price been so important to the American people. There is no question about our ability to furnish better service for less money than electricity, and this fact must be driven home to the consciousness of the American housewife. We have never had so good an opportunity as we now have to convince the public that the use of gas is the best way to save money and to obtain service.

Our big job, then, is to get a full recognition of the need of presenting such a story to the public through a carefully designed, national program supported by all of the gas associations and their various company and individual members. We must make sure that the operators of electric utilities thoroughly understand that the gas industry augments the electrical industry through the part it plays in building industries and industrial payrolls, and that, through this, more light and power will be sold. If this idea were more thoroughly understood, the dual companies would be less eager to convert to electricity that part of their gas business which is so necessary to the profitable operation of their gas properties.

Dual Companies' Responsibility

I am not saying this in a critical sense for I realize that among our dual member companies there are numbered many of the most ardent and progressive proponents of the gas business. However, there is a tendency in almost all dual companies to spend more per dollar of estimated revenue on electric cooking promotion than is spent on gas. If an electric range can earn a greater net revenue than can a gas range; if the investment in gas facilities can be made to

pay their keep without the cooking load; and if the public receives a service sufficiently better from the electric range to make it worth the difference in operating cost, then I say this tendency is justified and we gas men must ultimately yield domestic cooking to our electric friends. The dual companies hold the balance of power. As they go, so goes the domestic cooking load, and rightly so, provided their decision is guided by facts and not fancies.

My own personal viewpoint based on recent reports from men who have investigated gas and electric competition in the domestic field, and with particular reference to combination companies, is as follows:

1. That you can get a dollar of additional gas business with less expenditure of capital than you can get a dollar of additional electric business.
2. That there is a general probability under the above conditions that you can collect more net from the additional gas business than you can from the additional electric business.
3. That from figures furnished by 71 leading straight gas companies, an earning of 7 per cent on their invested capital was made, while 49 combination companies earned only 5.7 per cent. This is likely due to the fact that the combination companies are not pushing their gas business as much as the straight gas companies are.
4. That more benefits accrue to the public and to the company in return by selling gas service for cooking and water heating than by selling electric service for these purposes.

So far as I know, no entirely unprejudiced figures have been assembled on the relative net return earned by gas and electric ranges. I recommend this study to our Commercial Section as an important problem in its next year's program. In order that the study be unprejudiced, it might well be conducted jointly with the two electrical associations with which we work in harmony. Personally, I am confident that the figures will show that, while the electric range has a place, and a large place in the future of domestic cooking, its sale has no justification in territory adequately served with gas.

High Points *in* Natural Gas' Mid-West Outlook

By FLOYD BROWN
Vice-President, Natural Gas Pipe Line Company of America

IN general, the economic problems confronting natural gas in the Middle West are not essentially different from those encountered in the West. Our problems, however, present certain complications which do not appear to be so prevalent on the Pacific Coast.

In the Middle West there are many states involved, with a lack of uniformity of laws governing production, transportation and distribution. In carrying out various phases of a single project, a company often finds itself confronted with laws and regulations of four to six different states. This condition results from the fact that the larger markets are remote from the producing fields.

The authority and responsibility of utility commissions or regulatory bodies differ widely in the various states. Tax laws, conservation laws, license privileges, rights of eminent domain, and privileges extended to foreign corporations are different in practically every state. Coal competition has introduced an economic problem not generally encountered in the west. Political antipathy of state officials and utility commissions in the Middle West presents an unsolved problem. Each of these topics could well form the basis for an entire paper. However, in the limited time available, each will be touched upon briefly.

Reserves and Conservation

The sound projection of any natural gas enterprise depends first upon an adequate reserve or field supply. Nature has provided tight holders or reservoirs in which natural gas has been confined. However, these reservoirs can be emptied quickly and the reserve depleted, unless proper conservation methods are employed.

Recent decisions by the United States Supreme Court have done much to strengthen regulation and control of oil and gas reserves. The broad interpretations of the Champlin and Bandini cases have materially aided in bringing trying situations under control. In many fields, voluntary "unit development" has made it possible to eliminate waste and conserve this valuable resource.

One of the most flagrant violations of conservation principles exists in the Panhandle gas field of Texas, from which five major pipe-line companies with combined capacities of approximately 700 million cubic feet daily, obtain their principal source of supply. Those companies have projects in which they have invested over 200 million dollars. Although the life of the field and the soundness of pipe line investments depend upon conservation, there is approximately one billion cubic feet of gas being utilized wastefully or blown in the air each day.

The Panhandle field is productive of both oil and gas. Improper methods employed in completing oil wells have permitted direct communication between the overlying gas horizon and the oil strata. The wasteful dissipation of gas through oil development is rapidly depleting the reservoir energy, which forms the propelling force for moving oil through the sands to the outlet wells. Unless corrective measures are applied at an early date, millions of barrels of recoverable oil will be left in the sand and the reserve of dry gas depleted.

The Texas situation has attracted the attention of the Governor and members of the State Railroad Commission, all of whom are pledged to the policy of conservation of the state's natural resources. On account of local conditions and the wide diversity of interests, it does not appear that conditions can be corrected satisfactorily except through the adoption of some pooling plan for "unit development." At the present time, however, the Attorney General's office has stated definitely that the principles of unit development are in violation of the Texas anti-trust laws, although there are isolated cases where the plan has been employed in other parts of the state.

In view of anti-trust litigation now pending against some 16 oil companies in Texas for alleged infringement of the anti-trust laws, producing companies in the Texas Panhandle are reluctant to unitize their operations voluntarily until corrective legislation has been passed. The State officials are alarmed over the situation and it is quite likely that necessary steps will be taken to legalize "unit development" in Texas at the next session of the Legislature.

Transportation

It does not frequently happen that dependable reserves are located in close proximity to large consuming centers.

EDUCATION of the public in the economics of natural gas service will go far toward eliminating incidental problems which the expanding natural gas industry of the Middle West is meeting, says Floyd Brown in his message to the Pacific Coast Gas Association's 39th annual convention, held at Del Monte, Calif., last month. As an executive in one of the nation's largest natural gas transmission systems Mr. Brown is in a key position to analyze the current natural gas situation, and in this paper he deals with a number of diverse factors—competitive, regulatory, political, and others—which are being met by the Mid-West industry.—EDITOR.

For many years, long distance transmission of natural gas was considered uneconomical and impractical. Engineering science and skill have produced materials and improved methods for the solution of this problem. Continuity of service through long lines is still a factor to be reckoned with but the hazard has been reduced to a safe and practical minimum. As a result of the distance involved, transportation expense often outweighs commodity costs several times. The reverse is obviously true for short pipelines, which necessitate little or no compressor station investment and operation. Many of the so-called transcontinental lines originating in the middle and southwest require six to 10 compressor stations to deliver full line capacity to markets 300 to 1,000 miles distant from the field.

Railroad and Coal Competition

Natural gas in the Middle West meets in competition with coal and fuel oil in every domestic and industrial center. Natural gas is ideal in every respect and if it has failed to gain public and political approval, it is primarily because of lack of unified sponsorship.

The railroads and coal dealers always view with alarm the introduction of natural gas. The recent completion of three major lines into the north central part of the Middle West has attracted wide spread attention to natural gas competition. The feeling is accentuated by the fact that coal dealers and coal carrying railroads have already suffered heavy losses of revenue, due to the industrial depression. In some areas, the volume of coal handled has decreased as much as 50 per cent. It is only natural that the railroads and coal dealers should join to resist the loss of additional business, unless it can be shown that lower freight rates and reduced coal prices will result in further decreasing their revenue, without holding the competitive business.

The economic factors involved have been known to the pipeline companies and it was taken for granted that the railroads understood the negligible extent to which their volume of business would be affected. This seemed entirely plausible, since the three pipe line companies above referred to paid out for freight approximately nine million dollars in 1930-31 during the construction period.

The pipe line companies, however, could have undoubtedly forestalled the threatened break by bringing to the attention of the railroads and coal dealers basic economics and the small coal tonnage involved. Recent conferences have disclosed that the opponents had an impression that they were confronted with the permanent loss of a large percentage of their industrial coal tonnage.

It is a fundamental principle that a long distance transmission line must depend upon domestic business for its base load. The economics involved prevent natural gas from competing with cheap power plant and boiler coal, except for short intervals during the period of developing and connecting the domestic markets. This period should not exceed two years, except for occasional summer months during the off-peak season.

A pipe line must of necessity provide capacities in excess of the first year's domestic requirements, since no line can be constructed with sufficient flexibility to permit economically increasing its capacity as the domestic markets are developed. Obviously, during the period of load building, the pipeline company is confronted with the problem of securing a satisfactory load factor. The excess capacity above the early domestic requirements is available for industrial business. Since fixed charges and operating costs do not vary directly with the load factor, it is possible for the pipe line to supply for short intervals and in limited quantities natural gas in competition with coal and fuel oil.

Not understanding the economics of our problem, many of the coal dealers and railroads have joined hands in an effort to stifle the growth and expansion of natural gas, after the pipe lines were completed. The railroads have presented a unified front in petitioning the Interstate Commerce Commission for lower freight rates for the specific purpose of "meeting natural gas competition." Recent attempts have been made to convince the carriers that the proposed reductions are ill conceived, as it would mean the loss of revenue of 95 per cent of the volume of coal moving into the area, since the pipe lines are only temporarily interested in serving less than 5 per cent. The coal dealers are reducing prices on the same uneconomic theory.

Regulation

Generally throughout the Middle-West the natural gas industry is confronted with a bad political situation. Although the utility commissions and other state regulatory bodies are charged with the responsibility of fairly administering rates and exercising such control as will insure a reasonable rate of return for service rendered, there seems to be a growing tendency to disregard the equities as between the consumers and the utility companies. There are exceptions, of course, where public officials conscientiously and fearlessly render fair decisions, but political pressure brought to bear upon utility commissions has made their positions increasingly difficult.

Threats of ouster, cancellation of franchises and other forms of coercive pressure have been brought to bear by middle western Governors and utility commissions, unless rate reductions were promptly put into effect. In other instances, reductions in rates have been arbitrarily ordered without an opportunity for the utility to be heard. The employment of such procedures seems clearly to constitute a misappropriation of the authority vested in such regulatory bodies.

Relief from such orders involves expensive litigation at a time when the companies' earnings are badly impaired. Numerous utilities in the Middle West have voluntarily reduced rates rather than to incur the expense of litigation and exercise their legal rights. Such "strong arm" victories are contagious and other states have quickly seized upon the plan of "domination" rather than "fair regulation." However, the commissions are in a large measure guided by the newspapers and public sentiment.

The consuming public has witnessed a decline in commodity prices of virtually all of the necessities of life. It is difficult for the uninformed to understand clearly why the value of gas service should not be correspondingly reduced. However, inability of the utility companies to earn in excess of a fixed rate of return upon property values makes it impossible for them to accumulate earnings that can be applied against losses during periods of depression. Conversely, if losses are suffered during times of depression, it is impossible to procure higher

rates at a later date with which to wipe out past deficits. Until the public has a better grasp of the problem, it seems almost futile to expect political relief.

In an effort to relieve farm owners and small tax payers, most states throughout the Middle West have proposed or actually passed tax legislation which imposes upon industrial corporations and utilities the burden of meeting the increased cost of municipal, state and county government. Increased and burdensome taxes are being aimed at all branches of the natural gas industry. Increased production taxes are being proposed in a number of producing states. The severance tax is attracting wide political attention. A heavy sales tax on gas has been proposed by the Coal Dealers Association. Various forms of taxation can easily increase the price of natural gas to the point where it will be denied to the vast majority of the middle classes, at which time it will become a luxury for only those financially able to enjoy its benefits.

One evident reason for the lack of concerted effort in the solution of our economic problems is the wide diversity of interest in the various phases of any natural gas enterprise. It is seldom that landowners, producers, transporters and distributors are so organized as to be under a single management. They lack a unanimity of interest, thought and action.

Lastly, the uninformed consumers have been neglected. The public accepts the luxuries of natural gas as a God-given commodity in which they have a vested birthright and ownership. Radical politicians have attempted to gain public favor by calling attention to the fact that God gave us natural gas but that the grasping corporations had monopolized the supply and are now asking the consumers to pay exorbitant prices for something which is rightfully theirs. This propaganda has been woven into commercial moving pictures by politicians and opponents of natural gas. To my knowledge, this inheritance theory has never been applied to coal, oil, salt, sulphur, iron ore, copper or other natural resources that cannot be utilized or made available for public use and consumption without heavy expenditures of capital. Concerted action on the part of the industry in an attempt to counteract such unfavorable publicity is essential. If the difficulty is chargeable to public ignorance, then it is our problem to correct the misrepresentations.

The economic problems affecting natural gas today are all susceptible of solution through our own efforts. None is insurmountable. Education of the public should be the key-note .

Look *Behind* the Drive Against Utility Selling

By T. J. STRICKLER

Chairman, Natural Gas Department, American Gas Association; Vice President and General Manager, Kansas City Gas Company

IN the very beginning it should be said that experience in Missouri, Kansas and Oklahoma has taught us that the so-called "anti-utility merchandising" movement is nothing more or less than a smoke screen for municipal ownership.

When this agitation first developed in Missouri, we were inclined to regard the bud as something different; but now that it has become a flower, we realize that we failed to recognize in "anti-utility merchandising" the blossom of the flower of municipal ownership.

A brief history of the movement is necessary in order to appreciate more fully its real scope. In the first place, it is not a local movement. The guiding lights of the opposition state quite frankly that conditions in Missouri are no worse than elsewhere. They have been traveling from coast to coast affiliating themselves with the anti-utility merchandising agitators everywhere, so they have some basis for forming their opinions. Nor are they interested in securing anti-utility legislation in Missouri alone, but instead have visions of a nation-wide movement.

The anti-utility organization in the state of Missouri is known as the Fair Merchandising Association. When first started (some time in 1929) it was spoken of as the Western Chapter of the American Chamber of Commerce. This latter organization is headed by A. B. Walton, who in turn is associated with Carl Thompson.

The organizer of the Fair Merchandising Association is a man by the name of T. J. Smith. He was the first president of the Fair Merchandising Association, and is its present field man, and editor of the official publication of the Association, "So The People May Know."

BASING his remarks on first hand experience with anti-utility merchandising activities in Kansas, Oklahoma and Missouri, the author of this paper does not hesitate to call a spade a spade. He stamps this movement as "a smoke screen for municipal ownership," and substantiates his charges. Results of the Kansas-Oklahoma laws, and educational efforts of Missouri utilities on the merchandising issue, are also dealt with in this challenging message. Mr. Stickler, who is chairman of the A. G. A. Natural Gas Department, delivered this address on the Pacific Coast Gas Association's annual convention program at Del Monte, Calif. late in August. Due to space limitations, it is given only in part in these pages.—EDITOR.

I have samples of this publication which show the type of propaganda Mr. Smith is spreading through his paper "So The People May Know." Let me quote a few of the headlines from his publication:

"City Ownership of Gas and Electric Plants seems to be the Only Practical Solution of the Utility Evils As Well As Their Merchandising Racket."

"Reasons Why Cities and Towns Should Own Their Own Gas and Electric Plant."

"Public Ownership of Gas and Electric Plants Will End All Utility Evils Forever, Merchandising Included."

"Leading Statesmen of the United States See in Municipal Ownership a Real Public Benefit and a Winning Issue."

The last issue under date of June, 1932, deals entirely with the success of municipal plants. Those given are but a few of many similar titles which appear in practically every issue of this publication, and it is not difficult to see that anti-utility merchandising activity serves as a camouflage to hide behind while working for the real objective, which is municipal ownership.

Mr. Smith first made his debut in the Southwest where various companies were securing franchises for the distribution of natural gas. He would solicit funds from those who favored municipal ownership to sponsor his activities. He would spread propaganda among the hardware, plumbing and furniture group to the effect that if the franchise carried, the

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Water Heater Show Launches New Orleans Summer Sales

THE First Hot Water Service Show was held in Public Service Building the week of July 13, 1931, as part of the general cooperative sales program between the licensed master plumbers, water heater dealers, and New Orleans Public Service Inc. The purpose of the Show was to educate the public in the uses of hot water in the home, to exhibit in an attractive manner the various lines of heaters included in the group, and to secure as many prospects as possible. To accomplish these purposes, several novel features were introduced in the first show. There was a miniature geyser that erupted regularly; decorative fountains, unusual lighting effects, music and other attractions. Prizes in the form of credits to apply on the purchase of water heaters were given. It was necessary to register for these prizes, and in this manner a prospect list was secured.

To awaken further interest in the uses and value of hot water in the home, a series of lectures by home economic experts, licensed master plumbers and water heater dealers were given in the company's auditorium on the eighth floor.

In arranging the 1932 Annual Hot Water Service Show, it was decided to lay greater emphasis on attendance prizes, and also to improve the programs of lectures and demonstrations on the uses of hot water. Each of the seven water heater distributors included in the group agreed to give as a daily attendance prize one water heater, and, since the Show ran for only six days, this permitted the awarding of one water heater as a grand attendance prize at the close of the Show.

It was decided to award 50 attendance prizes after each program of lectures and demonstrations. Two programs were scheduled for each day, in the auditorium of the main office building, one in the afternoon and one in the evening, and while these prizes could be of no great value due to the large number awarded, they were sufficiently attractive and worthwhile to be appreciated by any one lucky enough to win them. Included in the group of prizes awarded were such items as utility fans, hair dryers, toasters, percolaters, baskets of food, toilet sets, etc.

Announcement of the Second Annual Water Service Show was carried in display space in the three New Orleans daily newspapers on July 8. Other advertisements ran consecutively each day until the close of the show.

To add a novel and attractive feature, tickets for the prizes were drawn from a huge grab bag. This was featured in the advertising of the Show. Each person entering the auditorium was furnished a ticket which allowed them to grab a ticket from the bag, which, if it contained a lucky number, entitled the holder to one of the 50 prizes.

Daily Programs

Considerable thought was given to the arrangement of the daily program, which was held at 2:30 p.m. and 8:00 p.m. each day.

These daily programs featured talks by prominent members of the plumbing, heating and appliances industries of New Orleans; laundry demonstrations, demonstrations of the uses of hot water in kitchen, with suggestions for dishwashing, care of gas range, kitchen furniture, window washing, etc. Bathing the baby and personal care were featured on another day, while a 20 minute talk was devoted to "Baths for Stimulation, Relaxation, Cleanliness," during another session. The use of "Hot Water as an Aid in Home Nursing" discussed hydrotherapy for various common diseases.

The attendance at the programs on the eighth floor for the Show was 2,264. In view of the fact that the seating capacity of the auditorium is only about 350, this meant practically full attendance at each program.

Registration for the water heater given as a grand attendance prize each day was held on the company's main display floor. Each of the seven dealers had attractively decorated display booths around the registration platform. A check of the general attendance for the week showed a total of 20,267.

In the promotion of the Show, the company released 6,240 lines of display advertising. The first advertisement appeared July 8, and other advertisements ran consecutively in the three daily newspapers each day until the close of the Show.

Car cards were placed in the street cars calling attention to the Show, as well as notices in the street railway "Service" bulletin, which is placed in the boxes in the sides of the cars. The company's two large electric signs were also dedicated to the promotion of the Show. Approximately, 4,000 invitations were sent out to a selected list compiled by the company, water heater dealers and licensed master plumbers.

The Second Annual Water Heater Show marked the beginning of a special campaign conducted through the months of July and August, featuring the installation of any heater in the group for $1 down and the balance added in 24 monthly payments to the gas bill, these terms being good whether purchase is made from a licensed master plumber, water heater dealer or New Orleans Public Service.

It is felt that the Show was decidedly successful, arousing public interest and appreciation in the uses and benefits of instant hot water in the home. Further, it aided in the continuance of the fine spirit of cooperation and good will between dealers and the gas company.

How Variables *in* Different Forms *of* Gas Affect Appliances

Natural, Manufactured, Propane and Butane-Air Gases

By W. P. COOK

Testing Engineer,
*A. G. A. Testing Laboratory**

THE question of "How Variables in Different Forms of Gas Affect Appliances" is one about which appliance manufacturers and others frequently seek information at the A.G.A. Testing Laboratory. The majority of these questions are answered briefly in this article in the discussion of the outstanding differences in the various gases and the factors which must be taken into consideration in appliance design to compensate for these differences. The adjustments which are ordinarily made on appliances to compensate for differences in the gas supply will also be mentioned.

One of the most important and difficult problems which confronted the Approval Requirements Committee of the American Gas Association when that group began the preparation of appliance approval requirements was the selection of the proper test gases. Obviously it would not be possible to test the appliances on all the different gases supplied, and yet it was necessary that an approved appliance be capable of satisfactory performance on all these gases with only simple and minor adjustments. A survey made of the gas supplied in a number of cities and municipalities at that time showed variations in heating values from 400 to 1,200 B.t.u. per cubic foot, specific gravities from 0.37 to 0.75, pressures from 2 inches to 10 inches water column, and chemical composition from 0 to 60 per cent hydrogen, from 21 to 96 per cent hydrocarbons, from 1 to 20 per cent inert gases (nitrogen and carbon dioxide) and from 0 to 35 per cent carbon dioxide. Tests were made using a number of these gases and as a result it was found that three gases which are now used as the test gases at the Laboratory would give a good indication of appliance performance which could be expected with any of these gases when used in any part of the United States or Canada.

More recently portable or bottled gas (propane) having a heating value of approximately 2,500 B.t.u. per cubic foot and a specific gravity of 1.5 and butane-air gas with 550 B.t.u. per cubic foot and a specific gravity of 1.16 have come into extensive use. Additions have therefore been made to the A.G.A. Approval Requirements for Gas Ranges to provide for the approval of these appliances for use with the two gases just mentioned. A.G.A. Approval Requirements covering space heaters and water heaters designed to utilize these gases are now in the course of preparation.

The certification that an appliance will give satisfactory performance in any section of the country involves primarily the determination of the correctness of its design. If an appliance is correctly designed, it is capable of adjustment and satisfactory operation under the conditions mentioned in the first part of this discussion. Such assumptions are based, however, on the theory that the gas supply is constant within the limits of pressure specified in the A.G.A. Approval Requirements, and that the chemical composition and the specific gravity of the gas supplied are constant within reasonable limits. If the variations in the gas supply are unusual, appliances cannot be expected to operate entirely satisfactorily.

Survey of Gas Pressures

A rather careful survey of gas pressure conditions over the United States indicated that 3.5 inches of water column is about average for manufactured gas, 7 inches for natural gas, 5 inches for butane-air and approximately 11 inches for propane. These figures therefore, were taken as the normal test pressures for the respective gases. Since permissible pressure variations are usually, with the exception of propane gas, equal to about 50 per cent either way from the average, the approval tests were designed to fit these conditions. With propane gas, owing to the fact that there is an individual regulator on each set, the pressure variations encountered are considerably less and it is sufficient to test the bottled gas appliances at pressures of 8, 11, and 13 inches of water column.

When all other conditions are the same, the increase in the gas input to a burner is directly proportional to the square root of the pressures. In other words, the gas rate at a pressure of 50 per cent above normal is 22.5 per cent above that at normal pressure. This increased gas rate may result in incomplete combustion. Such a result might be due to overcrowding the burner, increased length of the flames causing impingement, insufficient venting for the products of combustion, inadequate supply of secondary air or lack of primary air. A decrease in pressure results in a decrease in the gas input to the burner. This condition seldom causes incomplete combustion because the flame is shortened. There is, however, a tendency for flash-back to occur sometimes and the flames frequently become noticeably soft.

Before proceeding further with this discussion it will probably be well to review the chemical composition and the other outstanding characteristics of the gases being considered. Table No. 1 shows the typical characteristics of the gases.

It can easily be noted from this table that the natural gas shown has a high heating value (1,136 B.t.u.) and a high specific gravity (0.654), requires considerable air for complete combustion (10.69 feet for 1 foot of gas), and has a relatively low ignition velocity. This low ignition velocity is due to the fact that the hydrocarbon gases (methane and ethane) which are the principal constituents of natural gas are comparatively slow burning.

Coke oven gas, which originally was merely a by-product gas of coal coking operations at steel mills, is composed, as shown in Table No. 1, principally of hydrogen and methane, together with some carbon monoxide and nitrogen. The large amount of hydrogen, which

* Presented at the Fourth Domestic Gas Appliance Course and Home Service Conference, held at the A. G. A. Testing Laboratory, Cleveland, Ohio, June 14-17, 1932.

is an extremely rapid burning gas, is the cause of the high ignition velocity which this gas possesses. Coke oven gas has a heating value of about 540 B.t.u. per cubic foot, a low specific gravity (0.372), and requires 4.57 cubic feet of air per foot of gas for complete combustion.

The carbureted water gas shown, similar to that formerly served in Denver, is of an unusual type. It is of particular interest because of its high gravity (0.69), and its low heating value of approximately 400 B.t.u. per cubic foot. The gas also contains a fairly large quantity of hydrogen, carbon monoxide and nitrogen, together with an appreciable amount of methane, illuminants, (ethylene and benzene) and carbon dioxide. It will be noted that the maximum ignition velocity is not quite as high as that of coke oven gas, although the ignition velocity with usual burner adjustments is higher than that found for coke oven gas. This particular point will be covered in detail a little later.

TABLE NO. I. CHEMICAL COMPOSITION AND CHARACTERICTICS OF TEST GASES.

Constituents and Characteristics	Natural Gas	Coke Oven Gas	Carburetted Water Gas	Propane Gas	Butane-Air Gas
CO_2	0.1	1.2	3.6	.....	.....
Ill.	0.8	2.4	4.9	.....	.....
O_2	0.2	0.9	0.7	.....	17.3
H_2	0.1	55.9	31.0	.....	.....
CO	0.2	7.0	28.9	.....	.....
CH_4	80.0	27.6	9.7	.....	.....
C_2H_2	17.2	.....	.....	1.0	.....
C_3H_8	.....	.....	.....	97.0	.....
C_4H_{10}	.....	.....	.....	2.0	17.2
N_2	1.4	5.2	21.2	.....	65.5
B.t.u. per cu. ft.	1136	540	398	2585	550
Spec. Grav.	0.654	0.372	0.69	1.56	1.163
Air Reg.	10.69	4.57	3.29	23.9	4.50
Ignition Vel. (Max.) Cm per Sec.	31	68	63	29.5	31.5
Estimated Ignition Vel. (normal adj.) Cm per Sec.	7	13	21	8	10

High Gravity and Heating Value

Propane or bottled gas is practically pure propane together with a small amount of ethane and butane. This gas is obtained chiefly in the casing heads of oil wells or from natural gas, together with butane and natural gasoline, and is especially noted for its high specific gravity (1.56) and its high heating value (2,585 B.t.u. per cubic foot). It requires a large amount of air (23.9 cubic feet) to completely burn 1 cubic foot of the gas and the ignition velocity is approximately of the same magnitude as that of natural gas.

Butane-air gas of 1.16 specific gravity and about 550 B.t.u. per cubic foot, is a mixture with air and contains about 17 per cent butane. The air required for combustion of the mixture is fairly low (4.5 cubic feet). The ignition velocity is also fairly low being approximately that of natural gas.

Of all the usual gases, hydrogen has the highest ignition velocity so that city gases similar to coke oven gas or carburetted water gas containing a large amount of hydrogen would normally have a high ignition velocity. The hydrocarbons, methane, ethane, propane, butane and the illuminants (ethylene and benzene) have a low ignition velocity which effect is readily apparent.

Carbon monoxide has an ignition velocity appreciably higher than the hydrocarbons but materially lower than hydrogen. The inert gases (nitrogen and carbon dioxide) are known to have a retarding effect on the ignition velocity. Generally speaking then, the manufactured gases which are the ones having the high ignition velocities, are characterized by short, sharp, well-defined burner flames while the gases which have lower ignition velocities (natural, propane and butane-air) tend to have longer and less distinct burner flames at what might be considered a normal air adjustment for the burners.

The chemical composition, of course, determines the other characteristics of the gas such as the heating value, and specific gravity. The specific gravity of the gas plays an important part in the satisfactory operation of an appliance inasmuch as it has a vital effect on the primary air injection of the burner. The air injected to the burner depends on the momentum of the gas stream, which is a function of its mass and velocity. A given volume of a heavier gas therefore would inject more primary air to a burner than the same volume of a lighter gas under the same conditions. Thus, coke oven gas which has a relatively low specific gravity would have more difficulty in injecting sufficient primary air to a burner than would carburetted water gas with the same heating value which has an appreciably higher specific gravity. This effect may be partially shown by comparing the flames on two burners, one of which utilizes coke oven gas while the other burns carburetted water gas. The burners are adjusted to consume the same volume of gas. It will be noted that the carburetted water gas flames are shorter and sharper than the coke oven flames. Part of the effect which is observed is due to the carburetted water gas used having a lower heating value than coke oven gas. Some of the effect is also due to the difference in the ignition velocity of these two gases. The ignition velocity varies with the amount of primary air. The characteristics of the two gases are such that the ignition velocity of water gas is higher than that of coke oven gas when the percentage of primary air of the total required for complete combustion, is the same for both gases. The ability of the two gases to inspirate primary air is readily shown by the fact that the air shutter for a burner utilizing water gas must be adjusted to a point where it closes off considerably more of the primary air opening than is the case when coke oven gas is used.

The same effect can be demonstrated using burners adjusted to utilize the same volume of coke oven gas and butane-air gas. In this case the difference in the flame characteristics caused by the heating values is practically eliminated, although there is still some difference in the ignition velocity. The chief effect observed, that of excessive blowing away from the ports of the butane-air flames, is due to the high specific gravity (1.2) of this gas. This phenomenon is emphasized still further when it is realized that the air shutter on the butane-air burner is virtually closed while that on the coke oven burner is quite open. The high gravity of butane-air gas and the resulting blowing on conventional burners has led to the adoption of the so-called velocity reducing spud to correct the difficulties encountered.

Effect of Change in Gravity

When an appliance is operating with a proper sized orifice and primary air adjustment, the effect produced by a change in specific gravity is as follows: An increase in specific gravity, other things being the same, will reduce the gas rate to the burner although the volume of air entrained with the gas per unit of time will remain the same. Owing to the reduction in the gas rate, however, the air to gas ratio will be

(Continued on Page 33)

Industrial Forms Aid *in* Selling *and* Holding Boiler Load

By J. F. AICHER

Industrial Engineer
Pacific Gas and Electric Company

EVERY company engaged in the distribution and sale of gas for industrial use sets up certain procedures for systematic and economical handling the manifold details involving consumer surveys, service and equipment estimates, tests and other items. The industrial engineer who is responsible for winning and holding the industrial load must be, in the order named, investigator and survey man, analyst, economist, salesman, engineer, coordinator, and "follow through" man.

J. F. Aicher

The important steps in the process of changing over boiler plants from the use of oil, coal, or wood to satisfactory gas firing are as follows:

1. Survey of the consumer's heat uses and requirements. This includes quantity of fuel used, maximum and minimum demand, careful measurement of fire boxes for adaptation of the gas equipment, together with selection of the equipment, including such automatic features as are desirable and applicable.

2. The estimate as to service, meter and regulator requirements, and costs.

3. The consummation of an agreement between the gas company and the consumer, agreeing on rates and terms. The gas contract and equipment contract are negotiated either together or separately. In many instances a dealer sells and installs the equipment.

4. The establishment of service, and installation of the equipment.

5. Starting up on gas fuel, making combustion tests, adjustment of dampers and gas burning equipment for best efficiency. Educational work among the operatives and those in charge, to insure economy and safety.

6. Periodical follow-up, to make sure that service is satisfactory, and to give new boiler plant employees the same first-hand instruction that was given those present at the time gas was first installed. Some installations require periodical combustion tests.

As these steps are carried out in the same way for hundreds of installations, a series of forms and charts, planned so as to simplify this work, are usually developed. Some such forms and charts, developed for the particular requirements of the Pacific Gas and Electric Company, are shown with this article. They are produced by mimeographing, rotoprinting or regular printing, depending on the requirements of the particular job.

Division_____ Date_____ PROSPECTIVE NATURAL GAS USE Sheet One

1. Name of Consumer (for Contract)_____

2. Address of Plant (for Contract)_____ Town_____

IMPORTANT - Fill in Lines 1 & 2 Exactly as the Words are to go into the Contract

3. Kind of Business_____: Name, Mgr. or Supt._____

4. Name of Owner, if different from Line 1,_____

5. Address of Office, if different from Line 2, _____ Town_____

6. Who is authorized to sign for consumer?_____

7. FUEL CENSUS: PRESENT FUEL USE PROSPECTIVE GAS USE

	(Bbls) Oil	(Tons) Coal	(MCF) Gas.	Surplus (MCF)	Firm (MCF)
Jan.					
Feb.					
Mar.					
Apr.					
May					
June					
July					
Aug.					
Sept.					
Oct.					
Nov.					
Dec.					
Total					

8. Information supplied by_____ for Consumer, _____ for P.G.& E.

9. Equipment (Quantity, size, make, type, to go on gas; make complete report).

Remarks

(If necessary attach additional sheets containing information and data.)

REPORT OF PROSPECTIVE NATURAL GAS USE Sheet Two

Division_____ Date_____

Name of Plant or Firm_____

Fuel Storage Capacity_____ Sp.Gr. Oil_____

How is fuel received, Tank Wagon, Car, Barge, or Pipe Line_____

Price paid for fuel F.O.B. Plant (Bbl. or Ton)_____

Description of Main Line Extension to reach Plant; size, location, length; names of other plants to be served by same extension, etc.

_____

_____

_____ Cost $ _____

Size, length of service to meter location at nearest point of gas use_____

_____ Cost $_____

Meter and Regulator Type and Size_____

_____ Cost $_____

Overhead_____

_____ Cost $_____

Total Company Cost $_____

Cost to Prospect from meter to burner tip

Make, number and size of Burner_____

_____ Cost $_____

Installation of Burners and Labor_____ Cost $_____

Incidental and Overhead_____ Cost $_____

Total Prospect Cost $_____

If prospect desires to purchase and install Burner equipment or contract for installation of burners with other than Pacific Gas and Electric Company give information here_____

Give on the reserve side of Sheet Two a complete description of the changes to be made in utilizing gas and an estimate of the savings resulting from gas use, also a complete description of the burner installation to be made.

PACIFIC GAS AND ELECTRIC COMPANY - NATURAL GAS DIVISION

INDUSTRIAL CONSUMERS OPERATION REPORT

CLASSIFICATION_____ DISTRICT_____

DIVISION_____ DATE_____ 19____

Average Load per hour:

Maximum Load per hour:

Minimum Load per hour:

Hours on each day:

Time on: A.M. - P.M. Time off: A.M. - P.M.

Number of boilers or kilns, etc.:

Kind of load - Constant or fluctuating:

Does plant operate Saturday afternoons?
Does plant operate Sundays?
Does plant operate Holidays?
Full or part load?

PERSONS TO KEEP IN CONTACT WITH IN CASE OF EMERGENCY:

NAME	TITLE OR JOB	DAY TELEPHONE	NIGHT TELEPHONE

Pressure to Consumer:
Size of Main:
Pressure in Main:
REMARKS:

APPROVED BY: SIGNED:

NAME OF CONSUMER:

ADDRESS OF CONSUMER: STREET CITY

BILLING ADDRESS:

FEEDS OFF LINE NO: BETWEEN VALVES NO. and No.

SURPLUS NATURAL GAS CONSUMER DATA

(To be filled out in triplicate and sent to General Sales Department immediately upon contract being signed or at such prior date as signing of contract is assured)

Division_____ Date_____

Name of Consumer_____

Location of Plant_____ Street_____ City

Name of Person to contact at plant_____

Consumer desires gas service by (date)_____

Equipment in which gas is to be used (Boiler, Furnaces, etc.)_____

House piping, meter to point of use (Size and length)*_____

Boiler fuel regulator (Size)* and make_____

Size and number of burners*_____

Boiler and manifold (size and length)*_____

Pressure required on consumers pipe system*_____

Size of Main_____ Service_____ Size_____ Length

Main Pressure available_____

Load characteristics_____

Gas to be used - Time On_____ M. Time Off_____ M.

_____ Time On_____ M. Time Off_____ M.

Does Plant operate Saturday PM _____ Sundays_____ Holidays_____

Maximum Hour Demand_____ Cu. Ft. Time of Day_____

Maximum 15 Min. or instant demand_____ Cu. Ft. Time of Day_____

Average Hourly Demand_____ Cu. Ft. Time of Day_____
Maximum hourly demand
Total daily usage _____ Cu. Ft._____

*Note: Data given for equipment furnished by PG&E Co. If equipment is installed by consumer or burner contractor information may not be available.

Remarks:-

Date started using gas.

Classification:
Surplus ☐
Com. Heating ☐
Firm Industrial ☐

COMBUSTION TEST REPORT
GAS-FIRED STEAM BOILER
PACIFIC GAS AND ELECTRIC COMPANY

TECHNICAL DATA
NO. 486
PERIODIC TEST NO.
DATE OF TEST 1932

Name of Plant Location

Boiler-Maker-Type No Rated HP

Burners-Maker-Type No. Installed

Boiler Fuel Regulators, Size and Type

Stack Dimensions, other boilers on same stack, and their rated horse-power

Heating Value of gas B. t. u. per C. F. (Gross, dry) From Calorimeter at

COMBUSTION ANALYSIS—HEAT BALANCE—TEST RESULTS							MISCELLANEOUS DATA
LOAD ON BOILER	MAXIMUM		AVERAGE		MINIMUM		Boiler Furnace:
Meter Pressure							Width
Burner Pressure							Depth
Steam Pressure							Aver height
CO_2 %							Volume—C.F.
O_2 %							C.F./rated B.H.P.
CO %							Max. temp. °F
Excess Air %							Burner Orifices:
Stack °F							No. per burner
Draft-Furnace							M.T.D. size
Draft-Stack							Meter Data:
Damper Setting							No. of meters
Gas per hr. Std. CF							Size
Gas/hr/C. F. Fur Vol.							Type
HEAT BALANCE	Million B.t.u.	%	Million B.t.u.	%	Million B.t.u.	%	Constant
1. Gross Heat Input		100.0		100.0		100.0	Rec. gauge?
2. Stack Loss							Feed water temp. °F
3. Efficiency							

1. Gross heat input is defined as that amount of heat (BTUs) contained in the gas entering the boiler furnace.
2. Stack loss is defined as that amount of heat (BTUs) contained in the products of combustion and excess air carried up the stack. This determination must be made by an analysis and temperature taken of the same point from the stack or boiler breeching on the boiler side of the stack damper and as near to the boiler as practical. Samples taken from the boiler itself cannot be used in the determination of stack losses.
3. Efficiency is defined as that percentage of the gross heat input which is put to useful work in the operation of the boiler to:
   a. Heat water and/or generate steam;
   b. Make up radiation losses from boiler and setting.

REMARKS:

Original
For General Sales Dept.
Copy to Div.

Test Performed by

NOTICE

OPERATION OF NATURAL GAS BURNERS

TO START

1. Be sure all Gas Valves are Closed.
2. Open damper and air shutters to ventilate the Boiler.
3. Light the pilot with a torch. Do not turn pilot gas valve on until torch is lighted and placed in front of pilot.
4. Turn on burner valve slowly. The burner lights from the pilot. Do not try to light the burner with a hand torch.
5. Adjust the damper to proper setting.

TO STOP

1. Turn off burner valve.
2. Turn off pilot valve.
3. Close main gas valve.
4. Be sure all gas valves are closed when boiler is shut down.

In case gas is admitted to the boiler without being lighted, turn off main gas valve, open damper and air shutters and allow boiler to ventilate for ten minutes.

Do not change adjustments of burners, orifices or fuel regulators, as they are adjusted for proper combustion and to maintain the proper steam pressure.

A briefly worded enameled metal plate, shown in the lower right on this page, is furnished to boiler plants upon request for the guidance of operatives.

It can readily be seen that a compilation of the facts and data collected on several hundred installations, through use of these forms and procedures, is a valuable guide to establishment of uniform and efficient practices, and points out immediately any uneconomical or unsafe operating condition.

The Priceless Ingredient *in* Safety

Including a Discussion of Guiding Policies in the Lone Star Gas System Safety Program

By ARTHUR W. BREELAND

Supervisor of Safety
Lone Star Gas Company.

IN THE City of Bagdad, there once lived Hakeem the wise one who said one day to a young friend: "The Priceless Ingredient of every product in the Market Place is the Honor and Integrity of him who makes it." There is also a priceless ingredient in accident prevention and that can be covered in two words "Right Thinking." It was right thinking 20 years ago that awakened some of the industrial leaders to the urgent necessity of taking steps to reduce the appalling number of accidental deaths and maimed men and women in industry. It was the result of right thinking that the aid and influence of public spirited men and women were enlisted in the great fight to reduce the annual toll of human life, maimed humanity, and unnecessary suffering from accidents occurring on the streets, highways, playgrounds, and in the home. As a result of this right thinking, executives have been made to see that it is good business to prevent accidents and personal injuries not only from a dollar and cents standpoint but also from a humanitarian standpoint. We can account for the money losses but can we account for the needless loss of human life and limb?

A. W. Breeland

Safety—Then and Now

Let us contrast the plant of 25 years ago with the modern plant. Twenty-five years ago fast moving machinery, belts, flywheels, and gears were generally unguarded and numerous other hazards existed. Buildings were poorly illuminated and ventilated. When a workman took a job in a factory or plant he assumed the risk of being injured due to these hazards either by his own actions or those of a fellow workman and if he should receive an injury the employer and the courts turned deaf ears to his plea for compensation for his injury. He was not cautioned about the various unguarded machines, nor was he ever told anything about safety.

Today when a man enters a factory to work, he is told about the factory's accident prevention program. He is informed of the hazards peculiar to that particular shop and how to avoid them. In fact, he is made to understand that accidents are unwelcome visitors in the plant. When he enters the shop where he is to work he finds a well ventilated, well illuminated, and well heated building. He finds all belts, flywheels, gears, and other hazards properly guarded, and all necessary protective devices, such as goggles, respirators, etc., provided. In the event he should be injured, whether through his own negligence or not, he is given immediate medical attention, hospitalized if necessary, and properly taken care of until able to return to work. During the time he is compelled to be away from his work because of the injury, he is paid a portion of his average working wages. All of these reforms are the result of right thinking.

Carrying on a successful accident prevention program today is not a one man's job. Neither is it a one-sided affair. It must have the unqualified cooperation of every individual in the organization from the laborer on the firing line, on up to the president at the controls, and complete coordination between every department.

These principles have been proven in the Lone Star Gas system during the past three years. Previous to that time much thought had been given to losses resulting from accidents, but thorough analytical consideration had never been given the problem. Our organization, while only about 23 years old, until a few years ago was going through a period of development and growth and the inherent problems of development necessarily required a great deal of our executives' attention. When the problem had been thoroughly analyzed an organized safety program was the decision.

The very first act in putting our accident prevention program into effect was to put our properties in a safe mechanical condition and provide the proper and necessary safeguards and protective devices. We felt this to be necessary to prevent accidents from mechanical causes and at the same time to convince our employees of the management's sincerity in our accident prevention program. I want to say right here that it is my firm conviction that only a very small percentage of accidents is due to mechanical causes and lack of proper protective devices, and our experience during the past three years confirms this conviction. However, the accidents which are due to mechanical hazards are usually serious. For this reason and also to evidence the good faith which our management had in the program, mechanical safeguards were installed and protective devices, such as goggles, respirators, hose masks, non-sparking tools, and numerous other devices were provided.

Periodic Inspection Necessary

The management did not feel that we could stop when all necessary mechanical safeguards and protective devices had been provided and installed but felt that periodic inspections should be made of all properties to make sure that safeguards and protective devices were being properly used. On most of the properties this inspection is made mostly by the insurance companies' engineers and the supervisor of safety makes an annual inspection of all properties.

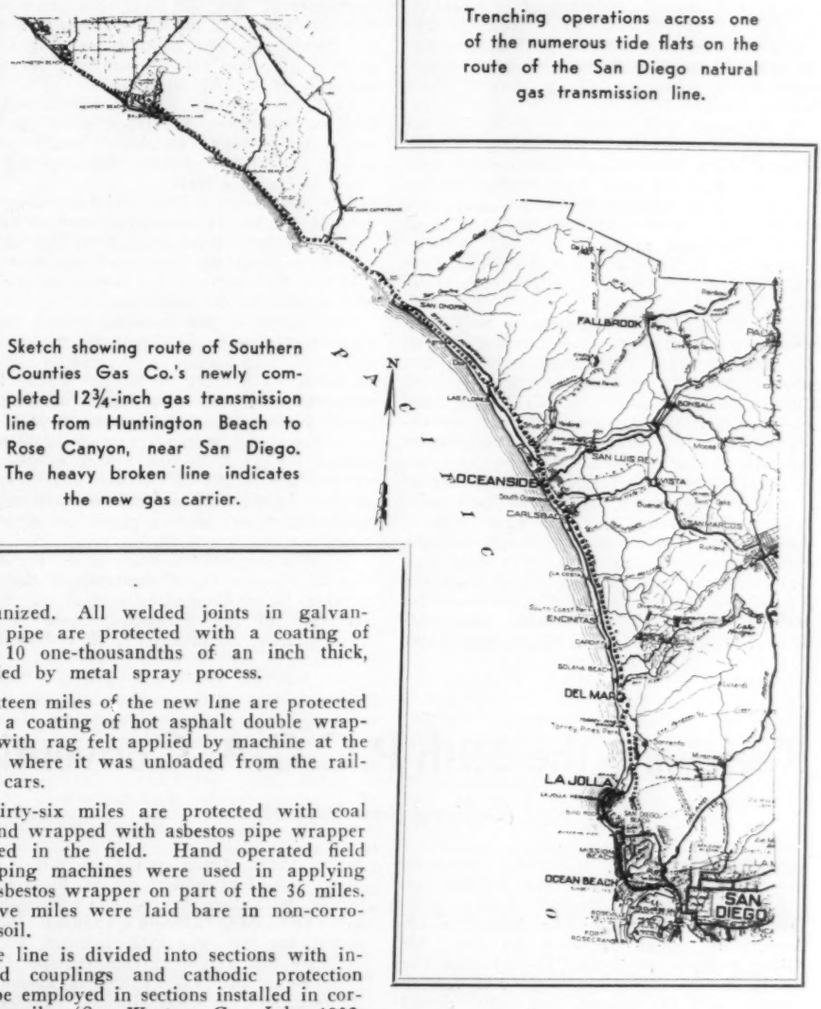
On one of our properties which has a number of natural gasoline plants and compressor stations in a relatively small area a rather unique system of inspection has been put into effect with surprising and very gratifying results. Once a month, on regular schedule, a committee consisting generally of all chief engineers or plant superintendents inspects all plants. This committee works in crews of two men, each crew being assigned definite parts of plants and machinery to inspect, for instance, one month one crew

(Continued on Page 36)

Line Completion Brings San Diego Change-Over Near

ABOVE

Trenching operations across one of the numerous tide flats on the route of the San Diego natural gas transmission line.



Sketch showing route of Southern Counties Gas Co.'s newly completed 12¾-inch gas transmission line from Huntington Beach to Rose Canyon, near San Diego. The heavy broken line indicates the new gas carrier.

THE Southern Counties Gas Co., Los Angeles, Calif., has completed its 80-mile 12¾-inch diameter gas pipe line from Huntington Beach, Orange County to Rose Canyon in the city of San Diego. Gas will be delivered to the intake of the line at Huntington Beach at the Industrial Fuel Supply Co.'s compressor plant which is connected by a system of transmission mains to all of the important sources of natural gas in southern California including the Kettleman Hills field, and will be metered and delivered to the San Diego Consolidated Gas and Electric Co. at the Rose Canyon terminus.

Two years ago when the Southern Counties Gas Co. extended its gas transmission system 12 miles south from Laguna Beach to serve San Clemente, it anticipated the ultimate delivery of natural gas to San Diego County cities, and installed a 12¾-inch high pressure main. This 12-mile section has now become a part of the new 80-mile transmission line.

Thirty-five miles of the line extending from Huntington Beach to the Orange County line southeast of San Clemente were installed by the Southern Counties Gas Co.'s construction forces, largely by hand labor. The 45 miles in San Diego County and city were installed under contract by Lindgren & Swinerton, Inc., of Los Angeles.

For about one-half of the distance, the line is laid on private rights-of-way. The line pipe is 12¾-inch O. D. plain and steel pipe and weighs 34.552 pounds per lineal foot, except where it is laid under water in six salt water marsh and channel crossings. A total of more than 2 miles of 12¾-inch O.D. steel pipe with a ⅝-inch wall thickness, weighing 81 pounds per lineal foot, was installed in these crossings. In addition to the six channel and marsh crossings, six rivers and creeks were crossed on highway bridges and several deep barrancas were crossed by spans of approximately 100 feet each.

Field welds on the San Diego County section were made by the electric arc method, using stream line chill-rings. On the Orange County section the field welds were made by the oxy-acetylene Linde process. All angles are mitered with the exception of those in exposed pipe on bridges where tube-turns were used. All welds were required to develop full strength of the pipe, which was checked by tension tests in the field.

Spur gear operated Venturi-type plug valves with 6-inch blow-down valves were installed approximately every 5 miles. No expansion joints were used except at each end of marsh crossings where the ⅝-inch wall pipe is connected to the lighter pipe.

A careful soil survey was made to determine the corrosivity of the soil along the route of the line and several types of protective coatings were used.

Where the pipe was exposed to the atmosphere, as on bridges and spans over barrancas, and also where it is submerged in salt water at channel crossings, the pipe is galvanized. All welded joints in galvanized pipe are protected with a coating of zinc 10 one-thousandths of an inch thick, applied by metal spray process.

Sixteen miles of the new line are protected with a coating of hot asphalt double wrapped with rag felt applied by machine at the point where it was unloaded from the railroad cars.

Thirty-six miles are protected with coal tar and wrapped with asbestos pipe wrapper applied in the field. Hand operated field wrapping machines were used in applying the asbestos wrapper on part of the 36 miles. Twelve miles were laid bare in non-corrosive soil.

The line is divided into sections with insulated couplings and cathodic protection will be employed in sections installed in corrosive soil. (See *Western Gas,* July, 1932, Page 14, for full report on protective methods on the San Diego line.)

Work was started on the Orange county section May 2, and was completed August 23. Work on the San Diego County section was started June 6, and was was completed August 26.

The line has a capacity of 24,000,000 cubic feet per 24 hours, with the present compressor equipment. This capacity may be increased to 30,000,000 cubic feet per day by the addition of a booster station, if required.

The cost of the line complete, without compressor stations, will be approximately $1,000,000.

San Diego Consolidated Gas and Electric Co. will begin change-over operations on or about September 5, under the direction of D. H. Perkins, superintendent of gas distribution. The company's "Adjusters Institute" has been in session for many weeks, convening on July 11, with 675 employees attending.

Several innovations have been employed in the conduct of the school and the preparation of customers' appliances. In addition to the truck described on Page 152 of the

September issue of *Western Gas,* a novel feature is the portable field headquarters. These are two units, built on trailers, measuring 8½ by 25 feet outside dimensions. They are equipped with a blacksmith and machine shop, electric lights and gas. The telephone company has been given a list of proposed locations and will bring their wires down the nearest pole. Field headquarters will carry a complete stock of equipment and appliance parts, work order forms, notification tags, etc., accident report blanks and all other forms. A small office is set up in the end of each trailer and a field clerk and stock clerk will carry on their duties there. Each unit will also carry a machinist and a welder. Messenger service will be set up between the main office and the field headquarters. The city will be changed over in sections, and these trailers will move into a section and stay on duty until the job is complete.

A. G. A. Planning Strong Program

THREE days of inspiring general sessions, sectional meetings and entertainment are promised to those who attend the Fourteenth Annual Convention of the American Gas Association to be held October 10, 11 and 12 at Atlantic City, New Jersey. Convention sessions will be held at Haddon Hall, the Traymore Hotel and the Ambassador Hotel, all located along Atlantic City's famous "Board Walk."

Registration will begin at 9 A. M. on Monday, October 10, with sessions of the Natural Gas Department, Accounting Section and Publicity and Advertising Section to be held throughout the day. The first General Session is scheduled to be held at Hotel Traymore at 8 P. M., and will be directed by R. W. Gallagher, president, East Ohio Gas Co., Cleveland, Ohio, and president A. G. A.

The Natural Gas Department will convene at the Ambassador Hotel at 2 P. M. on Monday, October 10, the meeting to be presided over by L. K. Langdon, chief counsel, Union Gas and Electric Co., Cincinnati, Ohio, and chairman of the Department. An exceptionally strong program has been planned for this session by A. E. Higgins, secretary of the Department. Judge H. O. Caster of Henry L. Doherty & Co., New York, will deliver an address on "The Economics of the Natural Gas Business"; Karl Griffiths, chief counsel of the Lone Star Gas Co., Dallas, Texas, will speak on "The Changing Attitude of Public Service Commissions Toward Utilities"; R. W. Hendee, vice-president of Oklahoma Natural Gas Corp., Tulsa, Okla., will talk on "Relation of Investment and Construction to Public Relations"; F. H. Brooks, president of Northern Gas and Pipe Line Co., Omaha, Neb., will speak on "Our Competitors," and R. E. Fisher, vice-president in charge of public relations and sales for Pacific Gas and Electric Co., San Francisco, Calif., has for his subject "Servicing and Sale of Proper Appliances."

The Accounting Section has scheduled several interesting features, including time and money-saving "wrinkles", and is sponsoring an exhibit of office labor-saving devices in Haddon Hall.

The Commercial Section is featuring the general theme, "Competition and What to Do About It." Both sessions of this section will be held at the Traymore, the first at 2 P.M. on Monday and the second on the following day at the same hour.

The theme of the two-day session of the Industrial Gas Section will be "Sales Promotion." The Section will introduce an innovation in holding a Round Table Sales Conference in place of a formal meeting. A good portion of this discussion will deal with hotel and restaurant sales problems.

The Technical Section brings to this convention the results of its three-year research in pipe joints, and an engineer will supplement this report with a paper on pipe-joint practice.

Hotel accommodations are under the direction of Chester Grey, chairman of the Convention Hotel Committee and A. G. Skean, secretary of the committee, Suite No. 16, Central Pier, Atlantic City, New Jersey.

Reviewing the 39th P.C.G.A. Convention

(Continued from Page 12)

evening program was the much-enjoyed motion picture of the natural gas industry, "Nature's Perfect Fuel", given through the courtesy of the American Gas Association, which prepared the film. Mr. Fisher took for his topic "The Human Factor in Business Development", and left the thought with his hearers that utility companies should cease trying to make the customer understand them, and give more heed to themselves understanding the customer.

One unique contribution from outside the gas industry was made by H. L. Lincoln, plant manager of the Union Ice Co., in his paper, "The Ice Industry Cries Excelsior".

Mr. Lincoln, in his illustrated discussion, convinced the convention that automatic refrigeration has in reality proved a stimulus to the ice industry. Turning to aggressive development of new markets, and to improvement of consumers' equipment and service methods, the nation's ice manufacturers show strong gains in sales, where losses would be looked for by those not familiar with the ice industry's program of self-help. Mr. Lincoln's address held a moral for any gas man inclined to overestimate the weight of competition.

Speaking on "The Trend in Cooperative Advertising", J. Chas. Jordan, chairman of the Association's Cooperative Advertising Committee, brought the convention an outline of what other industries as well as units of the gas industry are doing with this important promotional weapon, stating that 120 trade associations are now advertising cooperatively. He treated the special services rendered by cooperative advertising in the gas industry, through increasing use of the product, educating the public in its use, breaking down prejudices against gas, and protecting the industry against competition. Commenting upon the P.C.G.A.'s own splendid use of cooperative media, he went on to urge the expansion of this activity in the year ahead, recommending on behalf of the Cooperative Advertising Committee that the industrial advertising be continued, that a night radio program be utilized, that consumer magazine advertising be run regularly, and that the news and feature industrial service for trade journals be continued.

Lack of space makes it necessary to pass with brief comment the excellent parallel sessions held by the several sections, a majority of the papers and reports from the Accounting, Commercial and Technical Sections having already appeared in *Western Gas* for August. The Public Relations Section under the chairmanship of Geo. L. Myers of the Portland Gas and Coke Co. covered such important subjects as customer relations, customer ownership, employees' education and employees' welfare, in its Thursday afternoon session. The women's public speaking contest and a comprehensive address by Chairman Myers on "The Rising Tide of Revolt" completed the program. On the morning of Thursday the Women's Committee, a Public Relations Section activity directed by Clarita Scott Holden, held a special meeting covering many phases of women's committee work. An exhibit of women's committee material for the past year from a number of individual committees was of particular interest to women attending the convention.

The Publicity and Advertising Section's meeting, presided over by W. D. Thurber, Southern Counties Gas Co., general chairman, turned its attention to several current advertising problems, among them effective methods of dealer cooperation in advertising and merchandising. One of the most interesting contributions to the convention came from this Section in its exhibit of current advertising. One entire hallway of the hotel was occupied by "The Maze", consisting of panels showing newspaper advertising, house organs, and a complete range of "copy" used by member companies of the Association. The exhibit was created by a committee with Ella Russell of the Coast Counties Gas and Electric Co. as chairman.

Annual Banquet

Frank Wills
Awarded A. B. Day Medal of Honor

In line with tradition, the annual banquet made a fitting close to the convention proper, with approximately 275 present. President Stone ended his term of office in the role of toastmaster. Eric A. Johnston, president of the Spokane Chamber of Commerce, present at the invitation of the Association to deliver a feature address on the Friday morning session, was persuaded to speak again at the banquet. Convention honors were bestowed following the last banquet course, and those rewarded will be found listed below. Ladies of the convention presented Mrs. Stone, convention hostess, with an old fashioned set of gold, pearls and rubies as a token of their esteem.

Climaxing the distribution of honors to P. C. G. A. workers of the year past, came the first award of the Addison B. Day Medal of Honor, offered by Mr. Day, a past-president of the Association, for annual award to the Association member deemed to have rendered the outstanding individual service in behalf of the gas industry. This signal honor went to Frank Wills, engineer of production for the Pacific Gas and Electric Co., the award being made on behalf of Mr. Day

(Continued on Page 29)

C. Y. Bowers, Vice-Pres., Washington Gas and Electric, Passes

C. Y. Bowers, vice-president and general manager of the Washington Gas and Electric Co., Tacoma, Wash., died in July at the age of 37 years, following more than six years of service with the company.

Washington Gas and Electric Co. is a subsidiary of North American Gas & Electric Co. and in 1926 Mr. Bowers was appointed to take charge of the latter's western properties.

Mr. Bowers was born in Shelbyville, Ind., and received his education in the University of Michigan and Cornell, graduating from Cornell University. He served with the United States Aviation Corps during the World War. Since going to Washington he has been active in affairs of the Pacific Coast Gas Association, being a director of that body at the time of his death.

S. W. Guthrie Named Director of Los Angeles Gas and Electric Corp.

S. W. Guthrie

STANLEY W. GUTHRIE, of the legal firm of Guthrie and Darling, was elected a director of Los Angeles Gas Electric Corp., Los Angeles, Calif., to fill an existing vacancy, at a special meeting of the Board held late in August.

Mr. Guthrie, following his graduation from Stanford University in 1913, entered the legal department of Los Angeles Gas and Electric Corp. On January 1, 1924, he was made assistant general counsel for the company. He resigned from that position in March, 1929, to enter private legal practice.

Ready to Begin Construction of Oskaloosa-Waterloo Line

The Natural Gas Pipe Line Co. of America, with headquarters in Chicago, Ill., has been granted permission to construct, operate and maintain a pipe line to transport gas from its main line, the new carrier to take off at a point near Oskaloosa and extend to the south city limits of Waterloo, through Mahaska, Poweshiek, Tama and lack Hawk counties. Work on the 89-mile, 8-inch line will be started immediately.

The new lateral will supply natural gas to Waterloo, now served with manufactured by the Iowa Public Service Co.; to Newton served by the municipality, to Grinnell, served by Iowa Southern Utilities Co.; and to several other cities and towns en route. Capacity of the line will be 12,000,000 cubic feet daily.

Southern Union to Build 24-Mile Line in Northwestern New Mexico

Southern Union Gas Co., Dallas, Texas, is reported to be conducting a survey for a new gas transmission line to connect the Ute Basin and Farmington gas fields in northwest New Mexico, and to tie in with the Farmington-Albuquerque line of the Albuquerque Natural Gas Co., a subsidiary of Southern Union. The new carrier will be about 24 miles long.

John A. Fry

David F. Kahn

Philip O. Deitsch

Industry's Manufacturers Prepare to Launch National Advertising

EYES of gas men are focusing at the moment upon their manufacturers, as the coming national advertising which this branch of the gas industry has undertaken to sponsor begins to crystallize into definite form.

On August 18 selection of advertising and merchandising counsel was made, the Campbell-Ewald Co. being delegated this important work. This represents one of the final steps toward bringing into actuality the $6,000,000 gas range advertising campaign, financing for which is being underwritten by the range manufacturers under the ausipces of the A.G.A. Manufacturers' Section. Foundation for the campaign already has been laid by a special committee of the manufacturers, which will continue to function in cooperation with the Campbell-Ewald Co. John A. Fry, Detroit, Mich., is chairman of this committee, his fellow members being Philip O. Deitsch, New York, secretary of the committee; David F. Kahn, Hamilton, Ohio, chairman of the Manufacturers Section; and W. Frank Roberts, Baltimore, Md., chairman of the Range Division.

In a statement made late in August A. G. A. President R. W. Gallagher voiced every utility company's estimate of the coming national range appeal when he said: "The step taken by the gas range manufacturers not only evidences a remarkable degree of courage and confidence and bespeaks an unusual opportunity for gas industry improvement, but it likewise should have a healthy and stimulating effect on the general industrial situation."

According to Mr. Deitsch, manager of manufacturers' group activities and secretary of the national advertising committee, the campaign will stress the gas range as the most economic, speediest and most efficient modern cooking device, emphasizing its automatic time and heat control features

National advertising plans will have a leading place upon the program of the annual Manufacturers' Section conference, to meet at Cincinnati, Ohio, September 22-23. Details of the Range Division's Campaign set-up will be presented, and a general review of the Section's group activities made. The Section now has created the following divisions, separately officered with chairman, vice-chairman and secretary: Range, Water Heater, Space Heater, Gas-Fired Boiler, Gas-Fired Steam Radiator. Major projects of the Section as a whole will be discussed, including cross-licensing of patents and standards of practice.

Massing a support behind the national advertising campaign by the range manufacturers has proceeded at a rapid rate during the last few weeks. Several meetings are being held on the west coast, both at San Francisco and Los Angeles, as this issue of *Western Gas* goes to press, at which Philip O. Deitsch is presenting the proposed plan of action to western range manufacturers.

Mr. Deitsch also appeared twice before the Del Monte convention of the Pacific Coast Gas Association, as related at another point in this issue, giving the delegates a vivid conception of what the manufacturers have in store for the industry in this national advertising appeal.

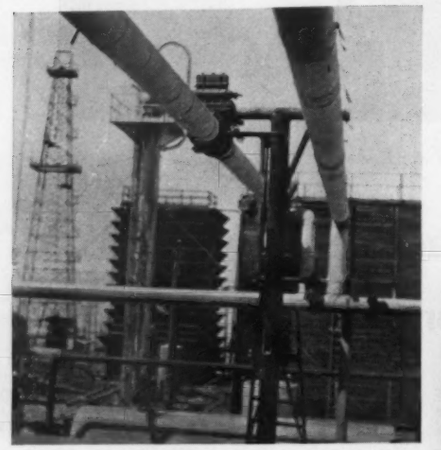
Northern Natural Extends Service Area

STATE headquarters of the Minnesota Northern Natural Gas Co. were moved August 15 from temporary offices at Wells to 225 First Ave. S.W., Rochester. F. W. Budd, assistant general manager of the Northern Gas and Pipe Line Co. at Omaha, has been named as manager of the company's operations in Minnesota. J. S. Stover will continue as manager of sales and Herman Briese, formerly distribution superintendent for Interstate Power Co. at Rochester, will continue in that capacity with Minnesota Northern Natural. H. D. Schrader has been named industrial engineer, and B. F. Muldown will act as cashier and accountant. Several changes and improvements are contemplated in the company's Rochester office to accommodate the enlarged staff.

Change-over operations at Rochester were completed early in August, by Minnesota Northern Natural Gas Co., now distributing natural gas there.

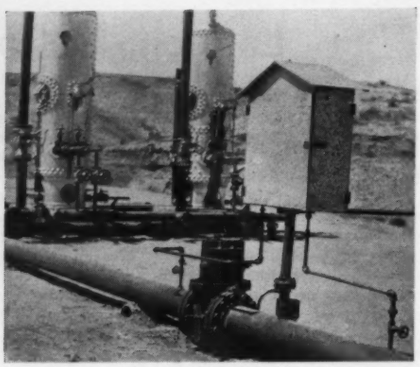
The company is completing laterals and extensions to Owatonna, Waseca, Austin and Albert Lea. The Austin distribution system has been leased from Interstate Power Co., with Minnesota Northern Natural Gas Co. serving straight natural there on completion of a line from Albert Lea.

Interstate Power Co. is getting its Owatonna and Waseca distribution systems ready for the change over to natural gas from manufactured on completion of line construction by Minnesota Northern Natural. Albert Lea, also served with manufactured by Interstate Power Co. will change over shortly to natural.



THE VIEW ABOVE shows the fitting installed on a steam line in a gasoline plant.

THE VIEW BELOW shows the Daniel orifice fitting installed in a wet-gas line at Kettleman Hills, Calif.



The Daniel Orifice Fitting

By J. A. CAMPBELL
*President, J. A. Campbell Company**

THE purpose of an orifice fitting is two-fold: It eliminates two shut-off valves, a by-pass valve and the accompanying fittings and pipe involved in the by-pass.

In addition to these two vital characteristics, which constitute the "why and the wherefore" of an orifice fitting, it must provide an accurate means of measuring flow.

In order to meet these qualifications, a fitting must have, inherent in its design and construction, a number of features that definitely suit it for its work, as follows:

Its installed cost must be less than that of a by-pass setting.

It must be rugged in construction, built to safely stand all pressures to which it is subjected, and have additional strength to resist line strains induced by expansion and contraction, creeping, sagging, or improper alignment when installed.

It must be accurate in bore and differential take-off dimensioning, and the plate must be accurately centered in the bore, to insure accurate metering. The plate must fit perfectly against the plate seat to preclude the possibility of any gas passing around the plate. Gas not passing through the orifice is unmetered.

The shut-off valve must effect a complete shutoff, so that when the upper chamber is open to the atmosphere, gas will not leak through. This is particularly desirable when a fitting is installed in any confined place, such as a vault or a meter house.

However, leakage under any conditions means a waste of gas. For the same reason, well designed stuffing glands with ample packing space should be provided for all working parts extending through the wall of the fitting.

The shut-off valve between the upper chamber and the bore must be so designed and constructed that it will not stick even under the most severe conditions of corrosive effect, and the facilities for lifting the plate from the bore to the upper chamber should be sufficiently powerful to overcome any tendency toward sticking.

The fitting should be so designed that one man can change and inspect plates with ease, dispatch, and perfect safety.

No brass parts should be used in the fitting in any location where they may come in contact with mercury. The mercury in the float pots of the recording gauges used in conjunction with orifice fittings sometimes blows over into the line and gets into the bore. This liquid metal readily amalgamates with brass and causes it to disintegrate.

Design of Daniel Fitting

Special features of the Daniel orifice fitting may be summarized as follows:

The upper chamber cap is designed for simplicity, with no complicated head gasket, and no threads in main casting.

In a 24-inch fitting built for 500 pounds working pressure, the heaviest piece of the top assembly weighs 14 pounds.

Orifice plate and valve are of stainless steel.

All stuffing glands are equipped with followers.

The plate carriage wipes the plate seat clean when forced down into position; then the plate snaps against the raised seat and is held tightly in place at all points around circumference. The plate automatically seats when lowered into position.

The plate carrier is of special corrosive-resisting metal.

Valve may be closed or opened with a quarter turn of a speed-wrench. Valve and seat are ground and lapped to a perfect fit.

The higher the pressure, the tighter is the valve forced against the seat.

Recessed stems on both the vent and equalizer valves operate by a socket on speed-wrench. Shafts, take-offs and drain are accessible from either side of fitting.

The plate lift mechanism makes possible a thousand pound pull by means of the speed-wrench.

The plate is centered in the bore of the fitting when lowered into place. The first move in the operation of raising plate with racks and pinions forces plate out from and free of seat.

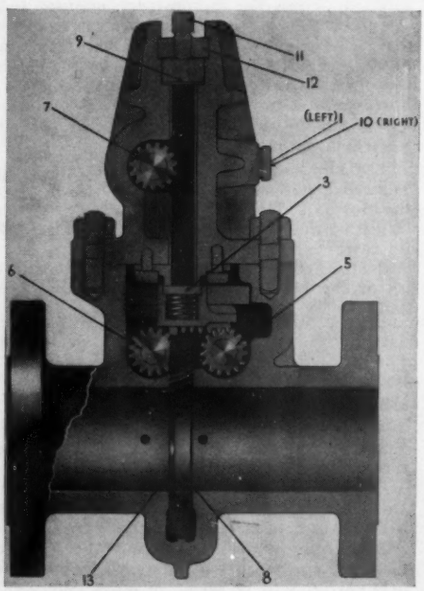
The orifice plates themselves are wafer plates merely inserted in carrier.

Due to the action of the gear lift, no jack screw is necessary at the bottom for raising the plate.

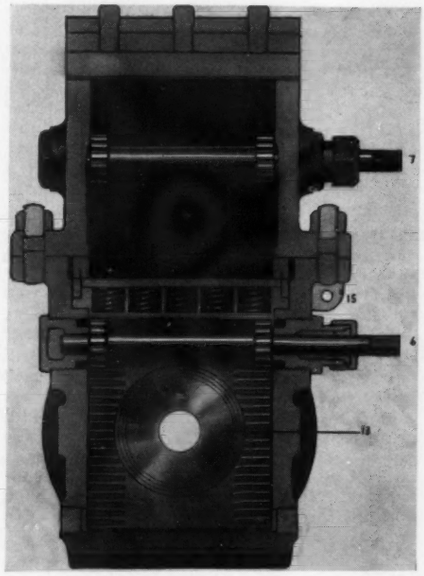
All glands can be packed under pressure. Provision is made for locking the fitting.

Procedure for Changing Plate

Open equalizer valve (1) with socket provided on end of speed-wrench.



*Presented before the Southern California Meter Association, July 28, 1932.



Open valve (3) by applying main socket of speed-wrench to valve shaft (5).

One quarter turn fully opens valve against stop.

Put speed-wrench on lower plate lifting shaft (6); turn until racks engage pinions of upper plate lifting shaft (7). Take wrench off (6) and put on (7) turning shaft till plate carrier (8) stops against sealing bar (9), putting wrench back on (5). Close valve. Next close equalizer valve (1) with small socket on end of speed-wrench. Top chamber is now completely shut off from line and plate is up in the top chamber. Next open bleeder valve (10) with small end socket. This releases to atmosphere the pressure in the upper chamber. Next, using main socket on speed-wrench, loosen set screws (11) in top assembly clamping bar (12). Slide clamping bar out and put main socket of wrench on shaft (7) turning so as to raise plate carrier (8) which will lift gasket and sealing bar (9) above top of fitting. When speed-wrench has turned plate carrier as high as it will go, carrier is then lifted out and a slight pressure of the thumbs against the wafer plate (13) removes it from the carrier.

The plate of desired orifice diameter is then inserted in the carrier and carrier placed back in upper chamber so that the racks in its edge are on the correct side to engage the pinions of the lifting shafts. There is no upside down to the plate, as the wafer is centered in the carrier plate. Next, put the main socket on shaft (7) and bear down slightly with one hand on top of plate carrier. This will engage the racks with the pinion and the carrier is lowered by the speed-wrench until it stops on top of the valve.

The next move is to replace the sealing gasket, the sealing bar and the clamping bar in the order named, and using the speed-wrench, to tighten up on the set screws. Next, close the bleeder valve (10) and open the equalizing valve (1). This is necessary because otherwise the full gas pressure in the line is holding the valve against the seat and with high pressure in the line it would be very hard to move. Now, with the pressure equalized in the upper chamber, use the speed-wrench and open the valve by means of the shaft (5) and then run the plate down with shaft (7) until it engages the gears on shaft (6). This contact is felt through the speed-wrench or is noted by turning the shaft (6) as the rack engages the gears and rotates it slightly. Next put wrench on shaft (6) and turn until carrier plate hits bottom. Orifice is now centered in line and tightly sealed in place. Next close valve by a quarter turn on (5) and shut equalizer. Upper chamber is now entirely shut off, the valve is covering and protecting the seat and the fitting is in full operation.

If it is desired to lock the fitting so that it cannot be tampered with, a simple casting slips over the two lower shafts and a padlock is inserted through the hole (15) and snapped in place.

New Officers at S. C. M. A. Helm in August Meeting

THE monthly dinner meeting of the Southern California Meter Association was held on August 25 at Hotel Robinson, Long Beach, with L. P. W. Des Brisay, newly elected president, officiating, and M. J. Cereghino, this year's program committee chairman, directing discussions.

"Pressure Regulation by Differential Controlled Pilot Valve" was discussed by D. L. Clark of the Southern Counties Gas Co. Mr. Clark described the operation of a new type valve which he has recently developed, one of the valves being on exhibit at the meeting.

"The Application of Rate Control to the Gas and Oil Industries" was dealt with in a paper by E. H. Hammond of the Neilan Co. Both papers will appear in an early issue of *Western Gas*.

In the August play for monthly possession of the S.C.M.A.-*Western Gas* Goodfellowship Trophy George Christen of the Pacific Meter Works brought in low net. A. E. DeBurn announced that the September tournament would be held at Rio Hondo Country Club, beginning at 9 a. m., September 25.

Two Administrations Meet

Following annual tradition, last year's officers and the newly elected administration met at an informal dinner, held on August 17 at the Commercial Club, Los Angeles. This dinner provides occasion for welcoming the incoming officers and discussing the Association program for the year ahead.

T. E. Roach Named Vice-President and General Manager, Wash. G. and E.

T. E. ROACH, on August 25 assumed his new duties as vice-president and general manager of the Washington Gas and Electric Co., with headquarters in Tacoma.

Mr. Roach was born in Omaha, Neb., and was educated there. For many years he was connected with the Union Power & Light Co. of that city. Later he became assistant general manager of the Northwestern Public Service Co. which operated electric and gas properties in Nabraska and South Dakota.

T. E. Roach

He became vice-president of the National Electric Power Co., operating group for the Insull properties east of the Indiana state line and extending from Maine to Florida and from Michigan to New Jersey, in 1925.

The operations of the Washington Gas and Electric Co. extend over western Washington and into Oregon. Besides the gas service in Tacoma and through Puyallup Valley communities, the company serves the following communities with gas,—Aberdeen, Hoquiam, Montesano, Centralia, Chehalis, Olympia, Everett and Snohomish.

Mr. Roach succeeds the late C. Y. Bowers.

Cedar Rapids Gas Co. Reports Up-Turn in Appliance Sales

Cedar Rapids Gas Co., Cedar Rapids, Iowa, reports an encouraging half-year in the sale of gas-fired refrigerators since January, 1932. According to A. L. McKinstry, sales manager of the company, Electrolux sales for the first five months of the year were 33 per cent ahead of the corresponding period a year ago.

To stimulate effort among the company's salesmen, Mr. McKinstry organized a Sixty-Dollar Club. Each salesman netting $60 worth of appliance sales in any one day receives a credit mark, and the salesman with the highest number of marks at the end of each month receives a substantial cash bonus in addition to his regular commissions.

Recently one of the Cedar Rapids papers sponsored a "Varieties and Models of 1932" contest, inviting merchants and business firms to enter the name of a popular product or article of merchandise. Young ladies of the Junior League were selected to represent the products. As a means of drawing attention to gas refrigeration, Cedar Rapids Gas Co. selected a popular debutante for its representative, naming her "Miss Electrolux." Mr. McKinistry also arranged for the gas company to have the exclusive refrigeration entry.

Southwest Welding and Manufacturing Co. to Distribute Papico Equipment

Arrangements have been concluded by the Southwest Welding and Manufacturing Co., Inc., of Alhambra, Calif., to manufacture and distribute the Papico Orifice Meter Run Assemblies, according to John Lucas, president. These assemblies have been manufactured for several years by the Pacific Pipe & Supply Co., which is in process of liquidation. The Alhambra concern was the successful bidder for this equipment, which comprised an important part of the liquidating firm's business.

It is the plan of the welding company to expand its manufacture of products, including the fabrication of tanks, pipe, heat exchangers, pipe bends, flanges, expansion joints, etc., for the oil and gas industry. Arrangements are being concluded for proper representation of Southwest Welding and Manufacturing Co. in the Mid-continent, as well as California territories.

Tucker Named Manager at Conroe

C. W. Tucker has been named manager for the Moran Gas Corp. of the South at Conroe, Texas. A pipe line was recently completed by the company from fields near the town to Conroe.

Look Behind the Drive vs. Utility Sales!

(Continued from Page 16)

utilities would take from them all the appliance business they had enjoyed in the past in the form of oil ranges, water heaters, kitchen appliances, etc., and that the utilities would make such ridiculously low prices on equipment that competition would be prohibited. Naturally, from this group he found willing listeners who would also give him financial support.

This is the manner in which the so-called anti-utility merchandising movement started. No one should be misled by the name of the organization, for its real motive is municipal ownership.

The appeal of an organization like that is not hard to understand. At the annual convention of the Missouri Association of Municipal Utilities, the president in one of his messages to the convention said, that, while these were extremely difficult times for private business, they offered an exceptional opportunity to municipal ownership. In other words, with business struggling to regain its balance the opportunity for municipal ownership to present itself as the economic solution, is excellent.

"Fair Merchandising"

The Fair Merchandising Association claims to have representatives in every political division in the state. Its activities are now openly in the direction of municipal ownership. Smith and others attempt to block the franchise moves of the utilities, not only in Missouri, but in neighboring states. Local organizations are formed to petition for rate reductions and revaluation hearings, and everything possible which might be inimical to private ownership is being promulgated by the Fair Merchandising Association.

The following is an advertisement of the Fair Merchandising Association, dated April 21, 1932:

"To Russell Dearmont,
Candidate for Governor,

"(1). Do you favor lowering utilities' service rates to the public, based on present low construction costs, in place of the high valuations of the past? (By utilities we mean water, gas, electric light and power companies.)

"(2). Do you favor municipal ownership as a means of lowering the present high utility rates?

"(3). Do you know that cities owning utilities are favored with an extremely low tax rate?

"(4). Do you believe in permitting utilities to sell their bonds to the citizens of this community at par value based on the high valuations?

"(5). Do you believe in extravagant merchandising by utilities which entails a huge loss and is borne by the rate payers?

"(6). If you favor the utilities in these matters, will you enter a public debate within thirty days in Springfield to discuss them? If so, announce date a week or more ahead.

"(There are several thousand people in Springfield and vicinity who would like your answers tonight.)

So. W. Mo. Rate Payers' Association,
Fair Merchandising Association."

In June, 1930, the National Retail Hardware Association in St. Louis passed a resolution condemning utility merchandising and asking its regional districts over the United States to take steps to oppose utilities merchandising. This, undoubtedly, was carried out, for in the last legislature of many states there appeared numerous bills to prohibit utilities from merchandising. Bills were presented in Alabama, California, Florida, Illinois, Indiana, Iowa, Missouri, Nebraska, Nevada, Pennsylvania, Tennessee, Texas, Wisconsin, Mississippi, Massachusetts, Kansas and Oklahoma. The bills in Massachusetts and Mississippi were defeated this Spring, and the utilities in these states should be commended for the admirable, frank and successful way in which they competed with the propaganda to foist such an unreasonable law on the people of their states. The bills in Kansas and Oklahoma were passed in 1931, and became laws which were put into force the same year. It is my information that a great many of these bills are again to be presented to the legislature in many of the states heretofore named and will be up for consideration in some states that I have not named.

The hoped-for effect of the merchandise laws was to have the volume of the merchandising business done by the utility fall copiously into the laps of retail dealers without further efforts on their part. It probably was not recognized at the time the anti-merchandising laws were considered, that the utilities only did about 30 per cent of the merchandising business, and that the other 70 per cent was handled by other merchandising agencies. They were no doubt looking at the figure of the total merchandising sales, when consideration was given to the amount of business that might be obtained by the dealers.

The only good that came out of the passage of the anti-utility merchandising laws in Kansas and Oklahoma was to prove conclusively that the laws were a mistake and that they are not in the interest of the public; that before state legislators pass such a law, a careful investigation should be made to ascertain the truth about the possible effects and not to pass such a law just because some particular group desires its passage for selfish gain.

Some of the Results

It was apparent that the merchants who had been most active in putting the utilities out of merchandising were not the ones who were getting the business. The chain stores, toward whom the opponents of utility merchandising feel about as antagonistic as they do the utilities, were the ones who were doing what little business was being done.

New business expense, wherever the utilities are at all active, in working with the dealers in an attempt to increase sales, is several times what it used to be.

Strange as it may sound, the dealers who were the most active in putting the utilities out of merchandising are, in many cases, the least interested in trying to develop the field which has been legislated to them.

Before the law went into effect, the dealers were out fighting for business. Now it is almost as hard to get the dealers to go out and close prospects who have already been approached by the utility solicitors, as it is for those solicitors to create an interest on the part of the customers in the first place.

The dealers have had extravagant ideas about the amount of business which came into the utilities by mere reason of the fact that they had merchandise to sell. The utilities canvassed for their business, but the dealers want the same volume to be done over the counter. The dealers defend this attitude by saying they cannot afford to have salesmen in the field. The result is that it is extremely difficult to get the story to the customer.

Little or nothing is being done to take care of the possible needs of the customers in the rural and community centers. The dealers who have the facilities to go out into the field do not feel they can afford to, and there are no dealers of any consequence in these smaller localities.

It is not uncommon for a dealer to unsell a prospect after the utility has closed the sale. A utility engineer will sell the idea of an electric feed grinder to a farmer. The utility engineer will then drive the dealer out to the customer and arrange for the delivery. The dealer may then turn around and sell the farmer a feed grinder to be attached to his tractor.

The dealers all express much more apprehension over the present activities of the chain stores than they ever did over utility merchandising. A few will admit that while they would not care to see the utilities merchandise, they probably would sell just as much merchandise whether they do or not.

The customers in the smaller towns and rural communities are almost unanimous in their criticism of the anti-utility merchandising law.

In the larger centers where the utilities attempt to solicit business for the dealers, the solicitors claim that during their solicitations about one-third of the customers approached voluntarily express their displeasure over the new arrangement.

In our study of the effect of the laws in the states in which they were passed, we found that there is hardly any line of business that has been excepted from the economic loss brought about by the passage of the law. The closest that we can estimate the combined losses to business in the states of Oklahoma and Kansas is something more than five and one-half million dollars per year.

In the final conclusion as to the effect of the anti-utility merchandising bill, it is apparent that it has not corrected any evils, if such existed. It has brought a loss to practically all lines of business in both states, has added materially to the unemployment, and is depriving customers of public utilities of service which they formerly enjoyed. These laws have added nothing and have taken away much.

Educational Program in Missouri

The latter part of my subject deals with the educational efforts in connection with proposals for future legislation. The Missouri Association of Public Utilities, representing gas, electric, water and railway utilities, through its members, recognized that these bills would be presented again, and laid out a program of education and co-operation. This program is as follows:

1. The Association, through its executive committees, subscribed to the "Statement of Merchandising Procedure" as accepted and published by the Electric Merchandising Joint Committee of national business interests in 1931, and the "Principles of Co-operative Trade Relations" adopted by the American Gas Association in the same year, and recommended that member companies promptly review the merchandising policies now in force and bring them in line with

these principles. The resolution adopted further states:

"That the weight of evidence clearly shows that where the utility promotes and sells gas and electric consuming appliances with due regard to sound merchandising principles and trade ethics, the best interests of the public, the merchants, and the utilities are served, and on this premise the Executive Committee of the Missouri Association of Public Utilities recommends that member companies promptly make contact with merchants in the territory served by them; lay frankly before them the facts as they are known and the policies they pursue;

"And that the merchants be offered by the utilities a full measure of sound cooperation in the merchandising field, to the end that a full and harmonious merchandising job may be done to the best interests of all concerned."

2. Stimulate the holding of meetings between the utilities and the retail dealers.

3. Employ field men to make contact with the retail dealers and utilities and do whatever they can to stimulate the holding of local meetings and straighten out any difficulties or misunderstandings between the utilities and the retail dealers.

4. Obtain newspaper clippings from Oklahoma and Kansas on all matters pertaining to the utilities and distribute them to the membership.

5. Ascertain the effect on the public of the law in the states of Oklahoma and Kansas, obtaining the financial losses to business in these two states.

6. We have arranged for an advertising campaign which is being carried out through 530 newspapers in the state of Missouri. This reaches practically every community. The purpose of this campaign is entirely educational and through it we hope to reach our general public.

7. The Association is acting as a clearing house for all information obtained and is furnishing such information to utilities, newspapers and principal citizens in the state of Missouri and to those interested outside of the state in order that everyone concerned may have the advantage of the experience in Kansas and Oklahoma.

The Missouri Association is carrying out this program because it has reached the conclusion, based on the experience of other states to date and the experience of the leaders in Missouri, that the heartiest cooperation on the part of the utility with the dealer will not stop certain organizers and interests from continuing to demand the entire cessation of merchandising by the utilities.

We further find that in those cases where the laws have prevented merchandising, the attack on the utilities has not stopped. We find that once the anti-utility merchandising laws have been passed, the utilities have been confronted by demands for additional taxation and regulation, franchise fights and strong municipal ownership movements.

We are doing everything within our power to cooperate with the dealers, subject to the principles that the utilities have a right to merchandise and that in so doing they are rendering a service to the vast majority of their customers.

(At this point in his address Mr. Strickler quoted resolutions adopted by a number of press associations which emphatically record the opposition of the press to anti-utility merchandising laws.)

Death Takes Roy L. Brooks

Roy L. Brooks, manager for Northwest Natural Gas Corp. at Klickitat, Wash., died July 20, at Klickitat.

Reviewing the 39th P.C.G.A. Convention

(Continued from Page 24)

by Harry L. Masser. In conferring the medal Mr. Masser enumerated many services in which Mr. Wills has distinguished himself and benefited the industry, among them his development of formulae for evaluating efficiency of gas manufacturing processes; his chairmanship of the P.C.G.A. committee on the Gas Engineers' Handbook; his work on fundamental formulae for burner design; his current year's report on "Flues and Chimneys for Gas-Burning Equipment"; his collaboration this year with Messrs. Willien and Harritt in developing a high B.t.u. oil gas process to provide emergency substitute for natural gas by utilization of existing plant equipment.

The annual convention golf tournament for men was run off on Saturday, following the conclusion of the convention, under the capable direction of W. M. Thompson, who has a long background in management of P. C. G. A. golf events. Results of the tournament are included in the summary of the convention awards which is tabulated below.

SUMMARY OF CONVENTION AWARDS AND CONTESTS

BASFORD TROPHY

To the Commercial Section (F. M. Banks, general chairman), judged to have contributed the outstanding Sectional accomplishments during the past year.

GOLD MEDAL COMMITTEE AWARD

To the Women's Committee, Clarita Scott Holden, chairman, for its noteworthy program of the year past.

HONORABLE MENTION—COMMITTEES

To the Committee on Fixed Capital Records, S. W. Binckley, chairman.
To the Committee on Load Building Value of Appliances, H. W. Geyer, chairman.
To the Committee on Pipe Protection, O. L. Wrestler, chairman.
To the Committee on Cooperative Advertising, J. Chas. Jordan, chairman.

ADDISON B. DAY MEDAL OF HONOR*

To Frank Wills, Pacific Gas and Electric Co.

GOLD MEDAL AWARDS

To R. A. Hornby, for his paper, "The Objectives and Funding of a Pension and Benefit Plan".
To R. E. Fisher, for the consistent and thorough program of company-dealer cooperation which he has directed in the Pacific Gas and Electric Co.'s service area.
To J. A. Harritt and Frank Wills, for the paper "High Heating Value Oil Gas as a Stand-by for Natural Gas" in which they collaborated with Leon J. Willien. Mr. Willien, operating gas engineer for the Byllesby Engineering and Management Corp., ineligible for the Gold Medal Award because of not holding membership in the Association, was accorded high recognition in the form of honorary membership in the organization.

HONORABLE MENTION—PAPERS

To E. H. Wetlaufer for his paper "Promotional Rate Structure and Inducement of Domestic Business.
To John P. Coghlan for his paper "The Public and the Public Utilities".
To Geo. L. Myers for his paper "The Rising Tide of Revolt".
To Elizabeth Lawton for the illustrated lecture "The Fires of Civilization".

The Awards Committee which conferred the above-listed honors, was composed of W. M. Henderson, chairman, C. B. Babcock, H. M. Crawford, F. H. Holden, R. A. Hornby, A. C. Joy, D. G. Martin, Wm. Moeller, Jr., Don C. Ray, and D. L. Scott.

*Awarded by a special committee headed by officers of the Association.

MEN'S SPEAKING CONTEST

Subject: "My Company as a Community Asset".
Won by H. W. Swanson, Southern Counties Gas Co., prize $50.
Second place, J. P. Matthews, Los Angeles Gas and Electric Corp., prize $25.

WOMEN'S SPEAKING CONTEST

Subject: "My Company as a Community Asset".
Won by Peggy O'Mahoney, Pacific Gas and Electric Co., prize $50.
Second place, Mae Layton, San Joaquin Light and Power Corp., prize $25.

BEST WOMEN'S COMMITTEE EXHIBIT

Won by Mrs. Marvel Murray, Los Angeles Gas and Electric Corp. Women's Committee Chairman, prize $25.
Second place, Clyda Weems, San Joaquin Light and Power Corp., prize $15.

ADVERTISING AWARDS

Best newspaper advertising—merchandising: won by Seattle Gas Co.
Best newspaper advertising—dealer relations: won by Southern Counties Gas Co.
Best newspaper advertising—institutional: won by San Diego Consolidated Gas and Electric Co.
Best house organs: won by Southern California Gas Co.
Best outdoor advertising: won by Southern Counties Gas Co.
Best direct-mail advertising: won by Pacific Gas and Electric Co.
Advertising sweepstakes: won by Southern Counties Gas Co.

CONVENTION LADIES' ADVERTISING CONTEST

Selection of five best pieces of newspaper copy, agreeing most closely to judges selection: won by Mrs. I. B. Adams, prize $10.
Second best selection, won by Mrs. John S. Spaulding, prize $5.

WOMEN'S GOLF

First prize, selected holes—Mrs. Wm. D. Dickey, prize, a service plate.
First prize, putting contest—Mrs. F. H. Bivens, prize, a purse.

MEN'S GOLF

Babcock-Pedersen-Basford Trophy, to low net: won by Clyde H. Potter.
Low gross: won by Victor Colburn.
High point prizes, Class A handicap: First, F. H. Bivens; second, G. H. Finley.
High point prizes, Class B handicap: First, Clyde H. Potter; second, H. L. Farrar.
High point prizes, Class C handicap: First, C. A. Swigart; second, E. D. Sherwin.

Fred C. Foy Leaves Seattle Gas Co. September First

Fred C. Foy has resigned as assistant general manager of the Seattle Gas Co., Seattle, Wash., to become manager of the Los Angeles office of the J. Walter Thompson Co., national advertising agency. Mr. Foy has been with the Seattle Gas Co. since October, 1931.

Beginning his utility work as assistant to Al C. Joy, manager of the publicity department of the San Joaquin Light and Power Corp. at Fresno, Mr. Foy left that position to handle new business and service public utility accounts on the Pacific Coast for the J. Walter Thompson Co. In October, 1931, he was "loaned" by that company to the Seattle Gas Co. to act as assistant general manager handling advertising, publicity, employee education and customer contact during a period of contemplated expansion. The latest change places Mr. Foy in the Los Angeles offices of the J. Walter Thompson Co. in the Petroleum Securities Bldg., as manager, effective September 1.

BUTANE - PROPANE NEWS
Covering Liquefied Petroleum Gas Service

Essentials in a Major Sales Program for Bottled Gas

DURING the past three years the Standard Oil Co. of California has built up in its Pacific Coast distribution area one of the most effective marketing programs for bottled gas to be found anywhere. The company has pioneered in the fields of sales organization, appliance utilization and servicing. It has elevated the standards of bottled gas service, demonstrating that success in bottled gas sales means "following through" to the consumer in the same manner which is recognized as necessary in piped gas service. Some of the high points in this outstanding bottled gas program are covered below, from information made available by Standard Oil Co. of California. —*Editor.*

STANDARD FLAMO is essentially a propane gas, compressed into liquid form and dispensed in steel cylinders, each containing approximately 91 pounds of product.

The pressure within the cylinder is approximately 150 pounds per square inch at 70° F. Immediately upon cracking the cylinder valve, gas vapor comes from the cylinder through a pressure reducing regulator which steps the gas down to the desired pressure, and from there through the house line to the appliance.

In order to successfully market over the entire Pacific slope the Standard Oil Co. utilizes approximately 800 substations, each having a delivery complement of three to seven trucks, and with a trained sales personnel of some 3,000 men, together with a large staff of service men.

Customer Service All-Important

It is the opinion of Standard Oil Co. of California executives that any company entering the bottled gas business must give ample thought to the future servicing of customers and building for a separate service organization which will have a definite responsibility of calling on every customer at least twice a year, and more often, if the occasion demands it.

For dispensing Standard Flamo from the storage cylinders to the appliance several types of installations are used, the principal one being the two-cylinder domestic installation consisting of a pressure reducing regulator with necessary fittings and connections, two cylinders in which to hold the liquefied gas, and a metal cabinet to house the regulator assembly and cylinders. But one cylinder is connected to the customer's house line at a time, the other being held in reserve. Immediately upon one cylinder becoming empty, the consumer switches over to the full one and then notifies the company, whereupon the empty cylinder is replaced with a full one.

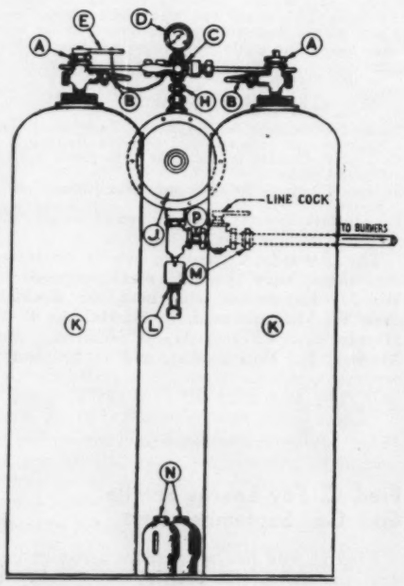
Thus, in addition to the two cylinders for each domestic installation, extra cylinders must be on hand to allow for transportation of the empty cylinder back to the refinery for refill so that it may again be put into service as a replacement cylinder. Accordingly, for every two-cylinder set an investment must be made in three cylinders instead of two.

The cylinders cost approximately $15 each, and other items of major importance such as cabinets, regulator assemblies, and miscellaneous fittings, total considerably higher in cost than the total cost of the cylinders.

Dealer Demonstrators

In order to acquaint prospective users of Standard Flamo with the product, an organization of dealer demonstrators was set up to function as demonstrators of the gas to prospective purchasers of Flamo-burning appliances. The dealers' entire profit, however, is derived from the sale of the appliance, the Standard Oil Co. cooperating with the dealer in assisting him to sell appliances to those consumers who have installed Standard Flamo.

Another problem presented itself in the marketing of Standard Flamo in that it was necessary to place the dealer in a position to finance appliance sales on a term basis. In order to do this the Standard Oil Co. inaugurated its Standard Flamo Budget Plan which provides a method by which sales made by demonstrating dealers may be financed, thus permitting the dealer to sell appliances, with payments extended over a period of time.



TYPE OF TWO-CYLINDER installation used for Standard Flamo service. Names of parts: A. Cylinder Valves. B. Pig Tail Connections. C. Manifold Valve. D. Pressure Gauge. E. Valve Wrench. H. Manifold Union. J. Pressure Regulator. K. Cylinders. L. Relief Valve. M. Service Union. N. Cylinder Caps. P. ¾ in. x 2 in. Pipe Nipple.

It was decided that in order to promote sales to those prospects not coming in contact with the demonstrating dealers, it would be well to establish a plan of selling appliances direct to the consumer. Such a plan does not seriously affect the Flamo dealer demonstrator in that the Standard Oil Co. does not become a competitor of the dealer in appliance sales, but to the contrary should the dealer have a prospect whom he is unable to close on the sale of an appliance, he requests the Standard Oil Co.'s assistance.

Stepping Up Appliance Efficiencies

In the beginning of the marketing of Standard Flamo it was found that the gas-burning appliances on the market were suitable for 550 B.t.u. manufactured gas, or 1100 B.t.u. natural gas, but because Flamo has a B.t.u. content of 2500 to the cubic foot, it was necessary to re-design practically every appliance on the market before efficient operation would result. This was especially necessary in that every cubic foot of Standard Flamo wasted meant a greater number of B.t.u.'s lost, and the consumer's monthly bill mounted rapidly.

It was then decided that in order to protect the consumer against the unknowing use of inefficient appliances, a policy should be established for hooking up Standard Flamo only to those appliances that had proved satisfactory for its use. As a result, it was necessary to request all manufacturers to send in their appliances which they felt would be satisfactory for use with Standard Flamo to the testing laboratory at Santa Fe Springs, Calif., for which test no charge was made.

After the appliances were tested a report was rendered to the manufacturer in order that the appliance could be re-designed to attain a greater efficiency with Standard Flamo, should it be so desired. As there was no charge for this service, it was but a short time until the laboratory at Santa Fe Springs was found too small to handle the large number of appliances submitted for test.

A testing laboratory, especially designed, was therefore built at Emeryville, Calif., completely equipped to test all types of gas-burning equipment. In order to have some method of control over the number of appliances being sent in for test, and to exclude appliances which would not even come close to being satisfactory with liquefied gas, it

was decided to make a nominal charge for all test work. Although this charge in no way covers the expense of maintaining such a laboratory, it does keep out appliances which are not readily marketable.

In the three years that appliances have been so tested, their general efficiency has been surprisingly increased, and manufacturers are now taking a direct interest in this work.

Although any appliance meeting the laboratory efficiency test is approved for hook-up to Standard Flamo equipment, it does not necessarily mean that it is being placed upon the Standard Flamo Budget Plan; only those appliances that are well known and have ready consumer acceptance on the Pacific Coast are considered for direct sale.

Since it is necessary to transport and store Standard Flamo in steel cylinders of considerable strength, the freight cost of transporting them must be added to the cost of the product, which in view of the fact that Flamo is sold on the Pacific Coast at a top price of 13½c to 10½c per pound, does not leave a great deal of profit for the marketer of the gas. The average consumer uses approximately 40 pounds of Flamo per month.

The Standard Oil Co. is working hand in hand with the gas utility companies in suburban districts by placing Flamo in the hands of those prospective users of piped gas who live in districts just beyond the gas mains. By using Flamo these customers become gas-minded and are readily converted when the gas mains are extended to make piped gas available to them.

Liquefied Natural Gas Corp. Files Incorporation Papers

Liquefied Natural Gas Corp., has filed incorporation papers in Minneapolis, Minn., with capital stock listed at $50,000. Incorporators were named as Leland Barker, R. J. S. Carter, Perry W. Snyder, all of Minneapolis, and C. F. Patterson of St. Paul. H. H. Henley of Minneapolis has been elected engineer for the company, and is engaged in an engineering survey in Redwood Falls and Glencoe, Minn.

The company plans to establish propane plants in key cities, distributing bottled gas from these centers to 50 or more towns in Western Minnesota.

Onarga and Gilman, Ill., May Be Served by Great Northern Utilities

Great Northern Utilities, Inc., with operating headquarters for the district in Watseka, Ill., has been granted franchise for the service of liquefied petroleum gas in Onarga and Gilman, Ill., and will construct plants and distribution systems in the towns, work to begin within the next few months, according to report.

Wm. A. Bowman Asks Butane Franchise at Eldon, Mo.

Wm. A. Bowman of Kansas City, Mo., has filed application for a franchise for the service of butane gas in Eldon, Mo. Mr. Bowman is reported to be planning construction of a butane plant and distribution system in that town.

Propane Gas for Indio, Calif.

C. E. McCartney of Petrolane, Ltd., Long Beach, Calif., was the successful bidder for a gas franchise at Indio, Calif., late in August. The franchise calls for distribution of liquefied petroleum gas. L. W. Thurlow will act as manager for the company at Indio.

SCAIFE

I. C. C. CYLINDERS

A majority of distributors of Liquefied Petroleum Gas now use the Scaife cylinder.

SAFE

ECONOMICAL

GOOD LOOKING

FOUNDED 1802

WM. B. SCAIFE & SONS CO.

Oakmont, Pa. (Pittsburgh District)

New York Pittsburgh Chicago

GROBLE REGULATORS & GOVERNORS

Complete Line of Regulators for

Natural, Manufactured, Butane and Propane Gas

Pacific Coast Representative,

T. G. ARROWSMITH COMPANY,

661 Howard Street San Francisco, Calif.

Phone Garfield 8419

GROBLE GAS REGULATOR COMPANY

Office and Factory: Anderson, Indiana

Hutchinson Gas Co. Turns on Supply of Propane August 10

Hutchinson Gas Co., Hutchinson, Minn., completed construction of a plant for the service of propane gas in that city early in August. The new service was begun on August 10. The propane gas is shipped to the plant in tank cars and transferred to a 60,000 pound storage tank from which it passes through a series of governors into the mains. The plant is entirely automatic in its operations. John Allen of Minneapolis, Minn., is general manager for the company, Charles W. Johnson is manager at Hutchinson, Emil Luedke, head of the sales division, and Al Rolander is in charge of the service department.

Warren Resigns Post With Virginia Gas & Utilities Co.

T. R. Warren, manager of the Virginia Gas & Utiities Co., Pulaski, Virginia, announces his resignation from that position to become sales manager for the eastern division of the National Public Utilities Corp. Mr. Warren will make his headquarters at Havre de Grace, Md. Virginia Gas & Utilities Co. serves butane in Radford and Pulaski.

To Distribute Bottled Gas in O'Fallon, Ill.

O'Fallon Natural Gas and Appliance Co. has opened offices in the Munie Building, O'Fallon, Ill., and will distribute Shellane gas and sell gas appliances. Melvin Hoefle has been named manager for the company.

Alabama Liquid Gas Co. Now Being Incorporated

The Alabama Liquid Gas Co. is in the process of being organized and incorporated to serve liquefied petroleum gas in 39 Alabama communities. Towns in Alabama to be served, in addition to Elba, are: Andalusia, Ariton, Atmore, Banks, Brantley, Brewton, Brundidge, Castleberry, Clayton, Clio, Dozier, Enterprise, Eufaula, Evergreen, Excel, Flomaton, Florala, Frisco City, Georgiana, Glenwood, Greenville, Kinston, Lockhart, Louisville, Luverne, McCollough, Midway, Milo, Monroeville, New Brockton, Opp, Ozark, Perote, Red Level, Repton, Troy, Union Springs.

Standard Gasoline Co. Officials Move Offices to San Francisco

Offices of several Standard Gasoline Co. officials have been moved to the Standard Oil Co. of Calif., headquarters at 225 Bush St., San Francisco, from Los Angeles. R. E. Beckley, general superintendent, D. M. Wolfe, technician, and R. E. Adams, personnel officer, are now headquartered in San Francisco.

De Busk Named Manager for United at Henderson, Texas

John J. De Busk has been appointed manager for the United Gas Public Service Co. at Henderson, Texas. General headquarters are maintained at Houston.

General Gas Light Offers Bulletin Descriptive of Overhead Units

General Gas Light Co., Kalamazoo, Mich., recently brought from the press an interesting catalog styled "The Humphrey Gas Unit Heater," describing the modern unit method of heating for commercial and industrial buildings. A brief explanation of the principle employed in the Humphrey overhead heating system is given with dimension drawings and photographs of the three models, No. 60, of 60,000 B.t.u. per hour rated input; No. 100, of 100,000 B.t.u.; and No. 200, suitable for especially large areas such as factories, warehouses, etc., with an input rating of 200,000 B.t.u. per hour.

Views and descriptions of applications of these three models in their special fields are given in chapters dealing with factory and shop heating, office heating, garage and hangar heating, service station heating, retail store heating, and auditorium and warehouse heating. A closing chapter deals with the overhead unit as applied in drying processes, such as motion picture film drying, drying lumber, and hair drying in beauty shops.

Copies of the booklet may be obtained by addressing the company at Kalamazoo.

Natural Gas Arrives in Paris, Ill., to Replace Manufactured

Natural gas was turned on in Paris, Ill., during the middle of August by Central Illinois Public Service Co., headquartered at Springfield. Supply for the town comes from a line constructed some time ago by the Indiana Consumers Gas and By-Products Co., extending from Terre Haute, Ind., to Paris. The line will also supply natural gas to Mattoon, Charleston, Effingham, Kansas, Ashmore, Neoga and Siegel, now being served with manufactured gas by Central Illinois Public Service.

Forty-Mile, 12-inch Line to Serve Houston Industries Planned

The Moran Corp. of the South, Houston, Texas, plans construction of a 40-mile, 12-inch line from the field near Conroe to Houston, Texas. The line will be used to transport gas for industrial use in Houston, and will be laid as soon as sufficient gas reserves have been developed in the new Conroe area, according to J. W. Moran, president of the company. The company recently completed a line from the field to the town of Conroe and adjacent territory.

A. A. Knoernschild Resigns His Post with Seattle Gas Co.

Alfred A. Knoernschild, who for 31 years has been connected with the Seattle Gas Co., Seattle, Wash., in a number of different capacities, left that utility on August 1 to become general manager of the Coon-Chicken Inn chain of restaurants, of Seattle, Salt Lake and Portland. Mr. Knoernschild's resignation was the occasion for a farewell party held in his honor.

Peck Now Sales Engr. for Natural Gas Division of Iowa Company

Announcement was made late in July of the appointment of H. B. Peck as sales engineer of the natural-gas division of the Central States Electric Co., the appointment effective August 1. Mr. Peck will have headquarters at Belmond, Iowa.

FISHER TRADE MARK

Use Fisher Gas Pressure Regulators for All Gas Service

Butane, Propane, Natural and Artificial Gas and for All Pressure Conditions

FISHER GOVERNOR CO.

201 South First Ave. MARSHALLTOWN, IOWA

1015 Santa Fe Ave. LOS ANGELES, CALIF.

KEROTEST tested and proved FORGED BRASS VALVES, MANIFOLDS and FITTINGS for PROPANE BOTTLED GAS SERVICE

Write for descriptive circular

KEROTEST MFG. CO.

PITTSBURGH, PA.

KEROTEST

Appliance Operation on Different Gases

(Continued from Page 19)

increased, a harder and shorter flame will be produced, which may lead to noisy burner performance or flash-back, although in some cases blowing or lifting from the burner ports will be produced. A decrease in specific gravity, of course, produces an opposite effect, there being a tendency toward long, soft flames which may lead to incomplete combustion. Either of these conditions if sufficiently marked or if persisting for any appreciable time will necessitate readjustment of the air shutter and possibly the gas rate itself.

The other important effect which is linked with the chemical composition of gas is due to the heating value. Natural gas and propane gas having high heating values, require the most air per cubic foot of gas for complete combustion. The air theoretically required for complete combustion is practically proportional to the heating value for all of the five gases shown. Difficulty encountered with the high heating value gases arises from two sources, first, low ignition velocity of the gases themselves and second, the comparatively small volume of gas needed to furnish the heat required. Because of this second fact it is difficult to inject sufficient primary air for proper operation. This characteristic is particularly noticeable with propane gas where it is necessary to materially reduce the rating of the ordinary range top burner designed for city gas, and to use a fixed spud in order to secure the maximum possible air injection necessary to obtain well-defined inner cones on the ports. It is aso necessary in this case to resort to a high pressure (approximately 11 inches water column) to compensate to a certain extent for the difficulties previously mentioned. The high pressure of the gas combined with the extremely small orifices used results in a materially increased velocity of the gas which aids in the inspiration of primary air. It should also be noted that natural gas is normally distributed at a pressure considerably in excess of that used for manufactured gas.

If we consider only the 400 B.t.u. water gas and the 1,136 B.t.u. natural gas, which have virtually the same specific gravity, the effect of heating value may be very well illustrated by two burners both of which are operating with a rating of 9,000 B.t.u. per hour and at a pressure of 3½ inches. The long, soft natural gas flame contrasts with the 400 B.t.u. carburetted water gas flame, which is vey short and well defined.

Heating Value Changes

The effects of heating value changes, other factors remaining constant, are in general the reverse of those occurring with specific gravity variations. A decrease of heating value is similar to an increase in specific gravity in that the rate of heat input is reduced, the flame, because of the reduction in the total air required for complete combustion, is hardened and both effects tend to promote flash-back and noisy burner operation. When the heating value increases the rate of heat input increases and the flame tends to become longer. Such action is liable to lead to incomplete combustion because of the overcrowding of the combustion chamber and flue passages and possible impingement of the flames on some portion of the combustion chamber. Excessive variations in either direction are undesirable and the gas rate to the appliance should always be reasonably close to that specified by the manufacturer.

The variations of the gas supply have thus been briefly considered. The manner in which chemical composition affects the velocities and also controls two other variables, the specific gravity and the heating value, has been noted. It now remains to discuss the effect of these factors on the appliances themselves. In the first place, the burners usually encountered are of the so-called Bunsen type in which a certain amount of air necessary for combustion is pre-mixed with the gas before it reaches the burner ports. With this type of burner it is not only necessary to adjust the gas rate but it is also necessary to adjust the amount of air which is admitted to the burners as primary air. These two adjustments are the only ones which are commonly made. However, where a burner has been specifically designed for manufactured gas it would be necessary to drill out the rather small burner ports to secure the proper operation of the burner on natural, propane, or butane-air gas. Otherwise the flames would lift and blow away from the ports and also they would probably not secure sufficient primary air. A great many appliances, however, particularly gas ranges, are supplied with burners which may be adjusted satisfactorily on natural and the manufactured gases supplied for city use. Different burners, however, are usually supplied for propane and butane-air gases.

Gas Range Burner Ports

If the gas range alone is considered, the burner which has been generally adopted by manufacturers for both natural and manufactured gas has No. 36 ports which are placed about 1½ inches below the top of the grates. The gas cocks are supplied with adjustable spuds which may be easily regulated and the air shutters, which are usually flat discs, may be easily rotated to their proper position and secured in place by a small bolt. For propane gas the burner ports are generally about No. 34. There are a large number of them to aid primary air injection, which is at a premium, and the ports are also spaced closer together than usual in order to improve the flame travel. As far as the air shutter is concerned, it is of minor importance since the burner ordinarily needs all the primary air which it is able to inspirate. Gas cocks are also equipped with extremely small orifices which must be kept clean and properly aligned with the burner throat and injecting tube in order to obtain satisfactory air injection. In order to secure as high an efficiency as possible with propane the top burners are usually located so that the top of the ports are only about 1 inch below the top surface of the grates. This procedure is possible with satisfactory performance because of the fact that each bottled gas set has its own regulator and the gas is of fairly constant chemical composition so that the input to the burner is maintained within a safe limit. It is absolutely essential, however, that the burner be adjusted properly both as to primary air and the gas rate, which is 5,000 B.t.u. per hour. It is possible on this reduced rate to obtain a distinct blue flame.

The usual range designed for use with butane-air is quite similar to the conventional type of range designed for city gas with the exception that the burner ports are larger and spaced as closely together as possible without interference between the individual flame cones. This is done to get a fairly stable flame which has reasonaby good travel. It should be noted that on a butane-air burner, the air adjustment is rather critical. In other words, there is a very small range of movement possible in the air shutter between those points at which yellow tips are obtained and that at which blowing occurs. Velocity reducing spuds which are commonly used to reduce the lifting or blowing effect of flames also serve to permit a wider range of adjustment of the air shutter.

Space heaters which include radiant heaters, circulators, gas-steam radiators, etc., occur in a multiplicity of forms and designs, and there is ordinarily no change made for their operation on various gases except a change in the burners. In some cases space heaters are supplied with separate burners having different port sizes for the different gases. On heaters designed for propane, special care is taken to insure the maximum possible injection of primary air.

On water heaters there is very little change in the heaters for the different types of gas burned, except in the burner. Many of the water heaters designed to utilize propane gas are modifications of the standard design used for ordinary city gas, with burners placed closer to the heating elements. In the majority of cases gas cocks having orifice spuds with fixed orifices were used.

Central heating gas appliances including boilers and furnaces have the same basic design for all types of gases, except that here again, changes in burner ports to accommodate the different gases are encountered, smaller port sizes occurring for manufactured gas; larger port sizes are used for natural and butane-air gas.

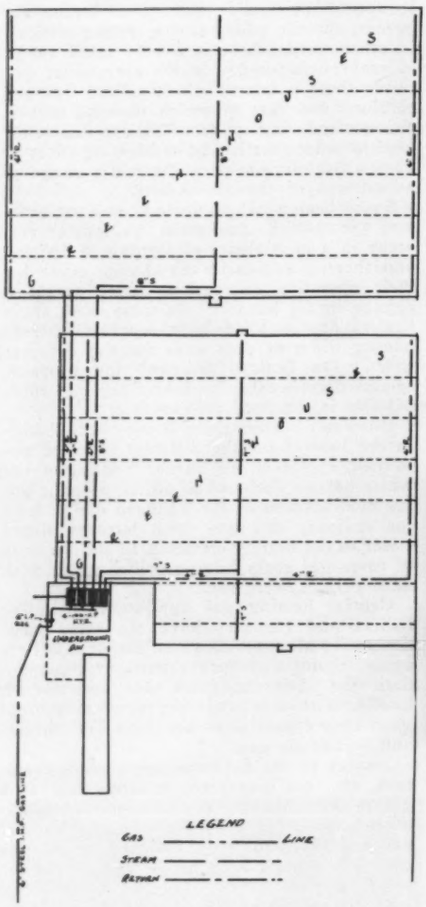
Insofar as the flueways, combustion chambers, etc., are concerned, it seems that as a general rule the majority of approved appliances are designed to accommodate natural gas and when properly designed to use this gas, they usually need not be altered for the other types of gases. This, of course, will lead to some slight difference in the efficiency of the appliance and the amount of secondary air passing through the appliance under different conditions, but these differences are so slight that for all practical purposes they can be disregarded. It can thus be safely said that the principal difference in the design of the various types of appliances operating on different gases is merely a change in the size or spacing of the burner ports and possibly the position of the burner to accommodate all the different types of gases commonly used.

A. G. A. Publishes Third Edition of "Combustion"

American Gas Association, 420 Lexington Ave., New York, announces publication of "Combustion", in its industrial gas series. The new book contains data on the technical phases of combustion, and is labeled "Third Edition", although practically entirely new in contents. Twelve chapters, 208 pages, with 60 figures and 58 charts, make up the contents of the book. Chapter headings are Heat and Measurement, Gas Volume and Pressure, Chemistry of Combustion, Thermal Capacity, Heat Transfer, Combustion Data of Commercial Gases, Atmospheric Burners, Industrial Combustion Equipment, Temperature Control, Heat Salvage Methods, Gas Analysis, and Fuel Comparisons.

Copies of the book will be sent on receipt of $2 per copy, plus mailing charges, by the Association. Special prices are offered on orders of over 30 copies.

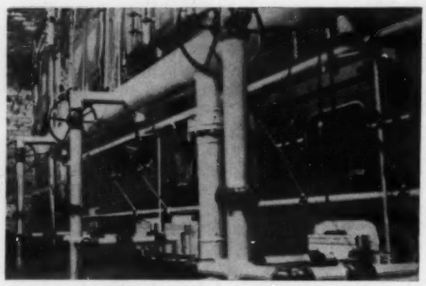
Greenhouse Load Totals 81,916 M c.f.



J. F. WILCOX & Sons., Council Bluffs, Iowa, is one of the largest growers of hot house flowers, particularly roses, in the United States, and is also one of the largest natural gas consumers on the lines of the Council Bluffs Gas Co., adding 81,916,000 cubic feet to the company's load in 1931. In January, 1932 the consumption was 16,600,000 cubic feet.

Four 100-H.P., three 80-H.P. and one 150-H.P. boilers of the horizontal return tubular type are used in the greenhouse, sending steam into pipes installed under raised beds. The entire plant is supplied through a low pressure steam system depending on a gravity return of condensation back to the boilers.

There are approximately 40 greenhouses, and in each of these there are 12 runs or coils of 1¼-inch pipe the full length of the house.



At Left: Typical layout at the J. F. Wilcox greenhouse. There are 40 individual greenhouses, each heated with natural gas. Above: a battery of gas-fired boilers in the Wilcox installation.

Esquimalt, Vancouver, B. C., to Have Gas Service Shortly

Construction of gas mains in Esquimalt, Vancouver Island, will be commenced immediately, following completion of an agreement between the B. C. Electric Power & Gas Co. and the city council. B. C. Electric has given the council an assurance that inside of two years an expenditure of $2,000 will be made in the Saanich municipality on gas main construction. While the two-year term is inserted in the contract, officials of the gas company state that work of laying the mains will begin almost at once. An agreement drawn up provides for Esquimalt charges to be made on the same basis as those in Victoria, while the meter rate will also be the same.

Pacific Gas and Electric Building 16-inch Line at Kettleman Hills

The Pacific Gas and Electric Co., San Francisco, has just started construction of a 16-inch line from its Buttonwillow line at a point near Dudley Ridge to the new absorption plant of the Standard Oil Co. in the middle dome of Kettleman Hills. The line will be approximately three miles long and the work to be handled by the gas construction department of the Pacific Gas and Electric Co.

Following the completion of this line, P. G. and E. plans to lay additional lines in the Buttonwillow gas field to connect the new gas wells recently completed in that area. This work will also be handled by the gas construction department.

Laboratory Announces Temporary Discount in Test and Inspection Fees

THE managing committee of the American Gas Association's Testing Laboratory at Cleveland, Ohio, has with the approval of President Gallagher, announced a further temporary discount of 5 per cent on all laboratory test and inspection fees paid within 30 days from the date of billing. This new ruling became effective on August 1, 1932.

In October, 1931, the laboratory managing committee put into effect, during the current fiscal year, a general discount of 10 per cent on all test and inspection fees. Although this meant a very substantial reduction in the total income of the Laboratory, it also amounted to an appreciable saving for manufacturer members of the Association.

The new discount which is supplemental to that of October, 1931, is largely in the interest of cooperating further with gas appliance manufacturers and, incidentally, keeping the amount of the Laboratory's oustanding accounts for testing and inspection work at a minimum. It is hoped that all gas appliance manufacturers will take advantage of this new discount, thereby enabling the Laboratory to be of further assistance to its supporting manufacturers during the trying period through which the industry is passing.

Construction of Shop and Laboratory for Southern Cal. Gas to Begin

Southern California Gas Co. will begin construction shortly of a new shop building, garage and laboratory at 1700 Santa Fe Ave., Los Angeles, with completion scheduled for November 15. The new structure will house a carpenter shop, tin shop, machine shop, garage, paint shop, battery shop, and car storage facilities. Operations will also include erection of a laboratory, gasoline service station, blacksmith, welding and pipe shop. The old garage formerly on the site has been moved to the Slauson Ave. station of the company and is being remodeled for use as a distribution building. The company is also repainting its 1,000,000 cubic-foot holder at 1700 Santa Fe.

To Utilize Stack Gases of Edison's Long Beach Steam Plant

Pacific Carbonic Ice Co., Los Angeles, plans to construct a plant on Terminal Island, Calif., for the manufacture of carbon dioxide ice from stack gases of the Southern California Edison Co.'s steam plant located near-by. The steam plant is fuelled with natural gas from Kettleman Hills, supplied through the mains of the Southern Fuel Co.

The new plant and equipment will represent an investment of $200,000, and will be in operation by February, 1933, according to T. F. Pattinson, manager of the Pacific Carbonic Ice Co.

Community Natural Moves Its Ballinger, Texas, Offices

Community Natural Gas Co., Ballinger, Texas, has leased the Marshall Northington Building, and will move its offices and warehouse there during the latter part of September. The new office has a more strategic location with additional display space available for gas appliances.

Handley, Texas, in Line for "Natural"

Shamrock Natural Gas Co., Fort Worth, Texas, is negotiating with the town of Handley to supply gas for a proposed municipal gas system. A meeting to discuss the proposal will be held on September 10.

To Begin Operations on Extension to Allouez and Itasca, Wisconsin

Superior Water, Light and Power Co., Superior, Wis., will begin construction immediately of an extension to give gas service to Allouez and Itasca, Wis. The development will cost in the neighborhood of $40,000.

Extends Service to Suburban Area

Newton Gas Co., Newton, Iowa, municipally owned, began extension of its gas mains to serve Lambs Grove, a suburb, during the middle of August.

Cain Gets Roodhouse Franchise

A. H. Cain has been granted a 30-year franchise for the service of natural gas in Roodhouse, Ill.

Standardize on MINNEAPOLIS-HONEYWELL *and Eliminate Control Problems*

WHEN you have placed a Minneapolis-Honeywell Control System on your installation, you are assured that your customer is deriving the fullest measure of satisfaction from his equipment and that your service department, with its thorough understanding of these controls, has kept its costs and stock at a minimum.

You know that the controls you have recommended and provided exactly meet the requirements, for there is a Minneapolis-Honeywell System for every need.

That is why we say "standardize on Minneapolis-Honeywell"—pioneers and leaders in the field of engineered automatic heat control since 1885. Gas appliance manufacturers, gas companies and dealers everywhere are effecting substantial economies both for their customers and for themselves by standardizing on this complete line of controls. You can do likewise. Minneapolis-Honeywell Regulator Company, Executive offices, 401 East Twenty-Eighth Street, Minneapolis, Minnesota. Factories: Minneapolis, also Elkhart and Wabash, Indiana.

CALIFORNIA BRANCH: 527 Market Street, San Francisco, California

(A) Type 610 Electric Diaphragm Gas Valve

Provides complete automatic control for all types of domestic or industrial gas fired equipment using low pressure gas.

(B) The Protectoglow

Guards against unburned gas by INSTANTLY shutting off flow if flame or pilot fails by breaking electric current and closing valve.

(C) Electric Clock Thermostat

Operates from house lighting circuit and automatically reduces and restores thermostat setting at predetermined times WITHOUT ATTENTION FROM USER.

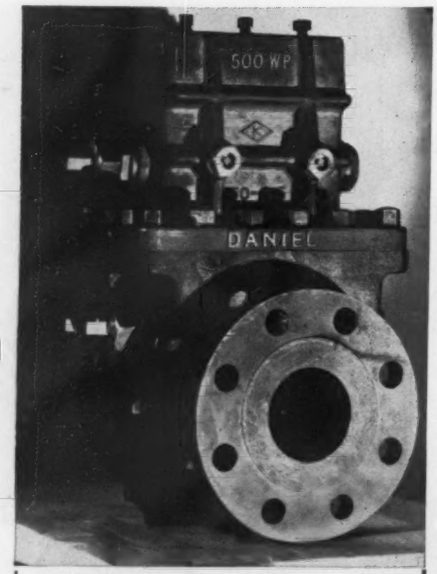
(D) Type V 15-1 Motor Gas Valve

Electric Main Gas Line Control Valve, operated from Standard Series 10, Room Thermostats, Limit Controls and Safety Devices

DISTRIBUTORS

Portland	Denver	Los Angeles	Salt Lake City
Arthur F. Erickson Co.	Daly Company	English & Lauer	Hawley-Richardson Williams Co.
315 Selling Bldg.	1635 Blake St.	1224 South Pedro St.	204 Dooly Bldg.

MINNEAPOLIS-HONEYWELL
Control Systems



The ORIFICE with lots of *Speed!*

DANIEL orifice fitting *IS* different—and a vast improvement. To lift the plate you simply turn a crank. Pressures are balanced. Nothing can blow out. Takes only a minute or so to change a plate. No place where leaks can occur. Utterly fool-proof. It's actually cheaper to install a Daniel. You save hours of labor each month; eliminate two shut-off valves, a by-pass valve and many fittings. The Daniel assures accuracy of measurement, quick-change and a life-time of service.

DANIEL ORIFICE FITTING

"A Crank for Convenience"

Ask for Bulletin

J. A. CAMPBELL CO.

Manufacturers of Gas Specialties

P. O. Box 669, Long Beach, Calif.

The Priceless Ingredient in Safety

(Continued from Page 22)

inspects buildings and structures, another electrical equipment and wiring, another pressure vessels and tanks, and another engines and compressors. The next month the crews will be changed and will also receive different inspection assignments.

This system of inspection has not only resulted in making this property more nearly accident proof from a mechanical standpoint, but it has also brought about many changes and improvements which have increased the mechanical and operating efficiency of the property.

Another conviction which has long been mine is that the vast majority of all accidents is due to lack of proper thinking on the part of the injured, his supervisor, or his fellow workers—the human element.

Educational Program

The next and most important step in our program was that of education. We have found that men generally will do their work properly if shown the right way. This same rule applies to accident prevention work. Show a man that it is to his advantage to work safely, as well as to the company's, and if he is the right kind of an employee, he will work safely. If he is not the right kind of a man, there is always another waiting for his place.

It has been our experience that the best way to influence a man is through a personal appeal. Since it is quite impractical to contact each man personally, the next most effective medium is through group safety meetings. Moreover, in a group meeting we have the advantage of mass psychology and discussions by different men. Safety meetings to be effective must be well planned, and conducted in a strictly businesslike manner, otherwise the meetings will lag and before adjournment the men will have forgotten that it is a safety meeting. One negative factor which we have endeavored to keep out of our safety meetings is that type of cut and dried safety talk which is neither inspirational nor educational, but consists generally of a stupid conglomeration of ponderous platitudes which grate on the nerves of the strongest and most patient. We have tried to make our discussions practical and in keeping with the gas or petroleum industry and the hazards which are common to our own group.

After our program was well organized, we placed the responsibility for the proper conduct of the meetings upon the shoulders of the foremen or supervisors in charge of the several departments of each district. A chairman and secretary are selected from among the employees to serve for a period of three months. The chairman arranges the program and conducts the meetings and the secretary keeps a record of the proceedings of the meetings. The minutes of each meeting are mailed to the supervisor of safety in the general office. This plan not only gives the men an added sense of responsibility and personal interest in our safety program but it also develops men in serious thinking and allows them an opportunity to train themselves to be able to speak before an audience and to keep more efficient and accurate records. Safety meetings should never be too lengthy as it is exceedingly difficult to maintain interest in any meeting over a long period of time. We have found that about an hour and a half is as long as the proper interest can be maintained. On some of our properties meetings are held as often as once each week, others once a month, and at some locations less frequently, depending entirely on operating conditions and accident frequency. The supervisor of safety attends as many of these meetings as possible.

Circular Letters of Benefit

Next in importance in our educational program is the individual and circular letters written to all supervisors from time to time on general and specific hazards, and also letters of the inspirational type. Some of these letters are written by the general superintendent but the majority of them are written by the supervisor of safety.

In our company, we have not followed the practice of some safety men of getting out so-called pep letters at regular intervals, but instead we have written our supervisors and occasionally our men on general and specific hazards. We feel that it is the unexpected rather than the regular letter which is most effective.

For a safety program to be 100 per cent effective, there must also be discipline. We hesitate to discuss discipline because we should prefer to eliminate accidents without it, but unfortunately all men do not respond to reason. It then becomes necessary to apply pressure in the nature of a penalty. Obviously we must have certain rules and regulations in our accident prevention program and to make these rules and regulations effective, penalties must be imposed. In our company the first infraction or violation draws a reprimand, the second an enforced layoff without pay, the length of layoff depending on the degree of guilt or negligence on the part of the man, and for the third offense the penalty is dismissal from our services. So far we have had few second offenses and only a very few dismissals.

Individual Accident Records

We also maintain an individual accident record system. With this system when a workman has his first accident a card is made out, showing his name, address, his foreman's name, date of injury, description of the accident, time lost, and cost of accident. When the third accident is posted to a man's card, it is called to the attention of his department head with request that a thorough investigation be made to determine, if possible, the man's fitness for the work in which he is engaged and to advise him that it will be necessary that he take steps to prevent further accidents. We believe that the mere fact that an employee knows that an individual record is being kept of all accidents and is aware that his record will not escape observation has a marked psychological effect upon him. We know that it gives the management a list of the "repeaters" and an indication of the individual's weakness or susceptibility to accidents.

With our organization, accident prevention in the beginning was an experiment—and what "a noble experiment" it has proven to be! The results have been both gratifying and surprisingly interesting. We are more than pleased with the decrease in accident frequency and the resultant decrease in cost. Since the full benefit in decreased workmen's compensation costs can not be had until after the fourth year, we have not, as yet, reaped the full measure of reduction in insurance costs, although our penalty or debit rating has already begun to decrease. What might

A Business Building Campaign

Tie-in Advertising Makes You a Partner in The Profits

THE newspaper advertisements reproduced on this page, with the invitation to see the local dealer selling various gas appliances, are creating a desire to buy, producing sales prospects, developing a ready market for you.

Live in Comfort this Winter
—7°
65°
Proper Room Temperature Natural Gas will maintain
is Now Easily Controlled this Healthful Comfort Zone
CONTROLLED HEAT
SEE YOUR DEALER OR THE
P·G·and E·
PACIFIC GAS AND ELECTRIC COMPANY
Owned · Operated · Managed by Californians

143,000
GAS USERS praise the convenience of CONTROLLED HEAT
HEAT WITHOUT CONTROL
CONTROLLED GAS HEAT
THIS WINTER thousands now heating by obsolete methods will learn that Natural Gas gives clean, easily controlled heat.
GAS HEAT will maintain this Comfort Zone at low cost
SEE YOUR DEALER OR THE
P·G·and E·
PACIFIC GAS AND ELECTRIC COMPANY
Owned · Operated · Managed by Californians

Your own advertising message should be published in space adjoining these sales helps. It thus gives you the benefit of P. G. and E. advertising and centers interest upon your store.

Here is a brief summary of sales helps for those who, for increased sales, want to DO SOMETHING ABOUT IT NOW.

1. Refer to the monthly P. G. and E. broadside showing reproductions of forthcoming gas appliance advertisements. Select those that apply to the appliances you sell and tie in with them in your local newspapers. Each P. G. and E. advertisement says, SEE YOUR DEALER. Your tie-in advertisement says, HERE IS YOUR LOCAL DEALER.
2. Have the Gas Appliance Society put your name on the mailing list to receive a monthly supply of stickers (reproductions of outdoor advertising) for use on your letters and packages to customers and prospects.
3. From the Gas Appliance Society, get your supply of gas appliance sales manuals.
4. You can also obtain card frames from the Society, for displaying reproductions of current gas appliance advertising. Use of this service and the foregoing tie-in methods identifies your store with current advertising which reaches thousands of home owners—your prospects—through newspapers, magazines, outdoor poster boards, bill stickers, truck banners, window displays, direct-mail, and other forms of business-building publicity.

Such tie-up advertising taps the full force of the major advertising campaign carried on by P. G. and E.; it has been profitably employed by hundreds of aggressive dealers in Northern and Central California.

No matter how much money is expended on the major campaign, its full benefit to individual dealers can be best realized only through complete coordination of all the business building programs . . . as was outlined to the entire industry at the Gas Appliance Society meeting in August.

To increase your appliance sales, tie in your advertising, sales plans, and displays with those of the major campaign.

WG-209-932

P·G·and E·

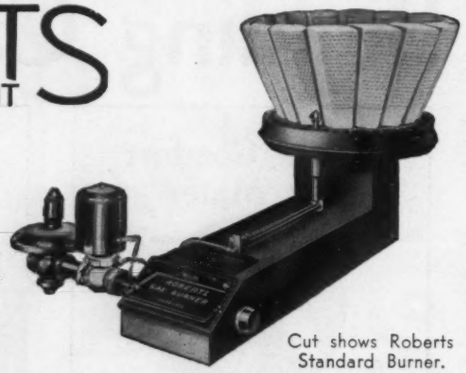
PACIFIC GAS AND ELECTRIC COMPANY

OWNED . OPERATED . MANAGED BY CALIFORNIANS

ROBERTS
CONTROLLED
GAS HEATING UNIT

ROBERTS-GORDON offers a complete line of conversion burners for heating the smallest home or largest commercial building.

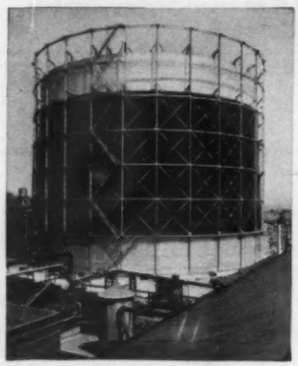
ROBERTS-GORDON
APPLIANCE CORPORATION
BUFFALO, N. Y.



Cut shows Roberts Standard Burner.

NO-OX-ID
IRON RUST
The Original Rust Preventive

FILLER RED



True Protection Under Your Paint

NO-OX-ID Filler red retains the remarkable chemical and physical properties that have made NO-OX-ID famous. In addition the surface hardens so that paint may be applied readily. Recommendations and estimates supplied gladly.

DEARBORN CHEMICAL COMPANY
LOS ANGELES:
807 Mateo Street, Phone TRinity 3385
SAN FRANCISCO
421 Bryant St., Phone SUtter 8688

"Antileke"

The hypo-sealed pipe joint saves 20% to 50% in laying cast iron or steel pipe and repairing any ordinary or difficult gas leaks.

Thousands in use without a single failure.

GAS & ELECTRIC FACILITIES, LTD.
447 Sutter St., San Francisco

Send literature and prices on "Antileke"

Name.....

Address.....

City.....State.....

If you would keep in touch with the Natural Gas and Butane industries, send a check for $2.00 to

WESTERN GAS
124 West Fourth Street, Los Angeles

Name.....

Company.....

Position Occupied.....

Street Address.....

City and State.....

Subscription Rates: I Year $2.00; 3 years $5.00; Foreign $3.00 per year.

be expected in decreased rates may be calculated from the decrease we have already made in frequency and lost ratio. In the year 1929, or the year we commenced our program, we had a frequency rate (accidents per million hours worked) of 78 and a loss ratio (ratio of actual cost of compensation, medical and hospital to premiums paid) of approximately 100 per cent. In 1930, our frequency was 38 and loss ratio 48. In 1931, our frequency was 6.2 and our loss ratio 16. For the first five months of 1932, our frequency is approximately 8 and loss ratio 16. The last fatal accident occurred in March, 1930. Previous to that time we rarely went a year without one fatal accident and in one year we had five fatalities. While we are now and shall continue to reap the benefits from our accident prevention work in dollars and cents, there is also an intangible return in the savings of life, limb, and the prevention of human misery and suffering which can not be calculated in its monetary value—it is priceless.

Another interesting result from our three years' experience is the proof that the human element is responsible for the larger percentage of accidents. We had been told this but to us it was a mere theory. Accidents which I have investigated have convinced me beyond a doubt that the greater percentage of all accidents is due to failure on the part of the injured or one of his fellow workmen to exercise the proper caution, failure to use the proper protective device which has been provided in other words, failure to "think." There are, of course, unavoidable accidents but very many less than generally thought.

Lowest Accident Records

Still another interesting result of this noble experiment is the fact that the companies in the Lone Star group which have carried on well organized safety programs have had the lowest accident records. In fact the companies which have been carrying on safety work for several years headed the list of the entire group for low accident and claim costs in 1931. Another one of the companies in the Lone Star group, in fact one of the largest units, put in safety work as a regular feature of its operating program the first of this year. Another one of the larger units in the Lone Star System has been carrying on a program to prevent automobile accidents. This program has not only resulted in a substantial decrease in cost of automobile operation and damage claims, but it has been instrumental in helping to maintain the good will of our customers, the value of which is inestimable.

All of this very constructive work and the gratifying accomplishments are the results of careful and deliberate thinking and planning, and if we are to keep up the good work we must be eternally vigilant, constantly watchful, applying "the priceless ingredient" of safety at all times.

Two-Month Range and Water Heater Campaign for Coast Counties

Coast Counties Gas and Electric Co., Santa Cruz., Calif., inaugurated a combination range and water heater selling campaign on July 28, the sale to continue until September 27. A quota of 120 ranges and 80 water heaters has been set by Pierre Vinet, general sales manager for the company. Terms of 10 per cent down and 12 months to pay are being quoted, and allowances of up to 10 per cent on traded-in equipment are being allowed.

COOKING FUEL COSTS CUT $400.00 A MONTH BY HOTEL SHERMAN, CHICAGO

Here's a story that will help you turn prospects into purchasers. Use it.

EARLY in 1930 the Hotel Sherman Company, Chicago, decided to save money by replacing obsolete cooking equipment. New Vulcan, All-Hot-Top and Open Top Insulated, Heat Controlled Gas Ranges, Vulcan Deep Fat Fryers, Radiant and Salamander Broilers were installed.

Mr. Albert H. Byfield, Vice-President, wrote recently: "The last seven months of 1930 cost us $7,003.00 in gas. The corresponding seven months of 1931, during which time we used the new ranges, showed a corresponding cost of only $4,017.00. January, 1932, shows a saving of approximately $400.00 as compared to the average of the preceding four years, and February is nearly as good."

The new equipment paid for itself in eight months out of the $400.00 a month savings in fuel . . . and now the $400.00 monthly saving is clear gain.

Everyone may not be able to show as large a saving, because the operating cost is based on amount of equipment, cooking done, age of equipment, and fuel. But, we do say that it will be to your advantage to call on hotels, restaurants, clubs, hospitals and schools, look over their equipment, get cost of operation and show them how new Vulcan equipment will help them cut their cooking costs.

5 WAYS THE NEW VULCAN GAS EQUIPMENT CUTS COOKING COSTS

1 Heat losses and gas consumption in oven cooking reduced by heavily insulated oven walls.

2 Over-heated ovens and resultant food shrinkage and waste of gas prevented by oven heat control.

3 Oven heat used more effectively in baking and roasting by improved flue system.

4 Top cooking made more efficient by All-Hot-Top. Heat of one burner spreads under entire top. All rings of burner quickly heat the top. Then one ring keeps it hot economically.

5 Labor costs reduced because range requires less watching due to automatic control . . . smooth front of range is kept clean with less work. More comfortable working conditions increase the efficiency of help.

STANDARD GAS EQUIPMENT CORPORATION
20 EAST 41st STREET, NEW YORK CITY
New York . Philadelphia Baltimore . Chicago . Boston . Birmingham
Pacific Coast Distributor . . . Northwest Gas & Electric Equipment Co. . . . Portland, Oregon

VULCAN EQUIPMENT MAKES GAS THE MODERN EFFICIENCY FUEL . . . CLEAN, FAST AND ECONOMICAL

BITUMASTIC
REG. U.S. PAT. OFF.
ENAMEL

UNDERGROUND
"Proven Protection for Pipe Lines"
UNDERWATER

Wailes Dove-Hermiston Corporation
17 Battery Place, New York
Philadelphia—401 N. Broad Street
San Francisco—345 Vermont Street
Cleveland—Union Trust Building
Los Angeles—2461 E. 8th Street
Chicago—20 N. Wacker Drive
Tulsa—Philtower Bldg.

LOOK beyond the product to its makers. This Company has recently erected and equipped one of the finest foundry research laboratories in the world. New machinery has recently been designed and installed to effect further refinements in the controlled production of de Lavaud pipe. Radically improved methods of applying pipe linings have been developed. This Company continues to act upon the principle that expenditures for betterment of methods or product should not be deferred.

U. S.
Cast Iron Pipe

United States Pipe and Foundry Co., Burlington, N. J. Sales Offices: New York, Buffalo, Cleveland, Chicago, Philadelphia, Pittsburgh, Dallas, Birmingham, Kansas City, Minneapolis, Seattle, Los Angeles, San Francisco

Fraser Console

Circulating Heaters
5 Sizes—2 Finishes
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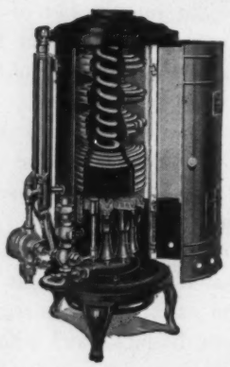

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Investigation of Mechanical Pipe Joints at A. G. A. Testing Laboratory

THE pipe joint research investigation which has been carried on at the American Gas Association Laboratory at Cleveland, Ohio, during the past 3 years has included among other things, an extensive study of mechanical joints for the Cast Iron Pipe Research Association. This branch of the work has now been concluded and a complete report on the subject comprising approximately 100 typewritten pages of discussion, data, and illustrations has been prepared and submitted to the pipe research association.

The drip oil tests which had been in progress for over a year in conjunction with this investigation have also been completed and a tentative report prepared and submitted for the consideration of the Cast Iron Pipe Research Association. In the conduct of these tests various gaskets were subjected to the constant action of drip oil under pressure for a period of nine months, after which approximately half the number were removed from the joints and examined. The remainder were then subjected to a drying action, first of air and then of natural gas for additional periods, following which they were removed and examined. Comparative sections of the gaskets were photographed, measured and weighed, and their appearance noted.

A set of specifications outlining a series of tests to which mechanical joints may be subjected to obtain an index of their performance is now being prepared. It is expected that these specifications will be available for general distribution at a later date.

Hoyt Elected as President of Los Angeles Credit Group

P. A. Hoyt, controller of Byron Jackson Co., Los Angeles, was recently honored by election to the presidency of the Los Angeles Credit Men's Association, one of the largest and most active credit groups in the United States.

Mr. Hoyt has been serving for some time past as director on the Association's Board, representing the California Oil Tool Manufacturers' Division.

New Low Rate for Large Consumers at Choteau, Conrad, and Valier

The Northwest States Utilities Co., headquartered in Great Falls, Mont., a subsidiary of Montana-Dakota Power Co., Minneapolis, announces a reduction in its gas rates in Choteau, Conrad and Valier, Mont. The new rates will affect consumers of more than 10,000 cubic feet monthly.

Merger of Two Birmingham, Ala., Companies Is Announced in August

The Industrial Gas Corp. of Birmingham, Ala., has merged with the Birmingham Gas Co. of that city, permission for the consolidation having been granted by the state public service commission early in August. The company will operate under the name of the Birmingham Gas Co.

Eagle Grove System Changed Over

Iowa Public Service Co., headquartered at Sioux City, changed its Eagle Grove system over to natural gas early in August.

Hydrauger Corp. Names Moody as New York Representative

Harry L. Moody was recently appointed district sales manager of the Hydrauger Corp., with offices at 233 Broadway, New York City. Mr. Moody is a graduate of the Massachusetts Institute of Technology, Class of '07. Following his training he was connected with the Westinghouse Machine Co. and Westinghouse Electrical Manufacturing Co. at Boston. In 1923 he left to become associated with the United Gas & Improvement Co. in charge of new business activities. Later he was affiliated with the Edge Moor Iron Co. as general sales manager, leaving that post to accept his present position with Hydrauger.

Design, Construction and Fundamental Equipment, Subject of Book

Volume V in a series of 11 volumes to be released by the President's Conference on Home Building and Home Ownership is now off the press. The book contains three of the final reports of the Conference, and deals with design, construction and fundamental equipment. The section entitled Fundamental Equipment contains information and recommendations on heating, ventilating, air conditioning, plumbing and sanitation, refrigeration, wiring and lighting. Collins P. Bliss, Dean of the College of Engineering, New York University, is chairman of the committee on fundamental equipment.

Brewster Named Consulting Engineer for Gas Conservation Board

Appointment of F. M. Brewster of Bradford, Pa., as consulting engineer for the Turner Valley Gas Conservation Board was recently announced in Calgary, Alberta. Mr. Brewster will confer with the board for an indefinite period in regard to the problems arising from the enforcement of the gas conservation law in Turner Valley.

Magnolia Petroleum Gets Permit to Build Carbon Black Plant

A permit to operate a plant in Wheeler county to manufacture carbon black from natural gas was issued to the Magnolia Petroleum Co., Dallas, Texas, during July by the Railroad Commission of Texas. An application for a permit for a plant at Pampa was held up pending an investigation by the commission.

Southern Calif. Gas Co. Building New Office at Lindsay

Southern California Gas Co., Los Angeles, began construction on August 2 of its new office building at Lindsay, Calif. The building will have an air conditioning system. E. M. Eyman is manager of the Visalia district of the company which includes Lindsay in its territory.

Pierre, S. D. May Rehabilitate Its Gas Plant and System

The city of Pierre, S. D., is considering the advisability of asking for a loan of $100,000 from the Reconstruction Finance Corp. to rebuild the gas plant and distribution system operated by the City of Pierre Utilities Department.

Line to Be Built to McCook, Neb., Now on Manufactured Gas Service

A lateral will be constructed to serve McCook, Neb., with natural gas, according to press reports from the district. Citizens Gas Co., a subsidiary of Central States Electric Co., Cedar Rapids, Iowa, is now serving manufactured gas there.

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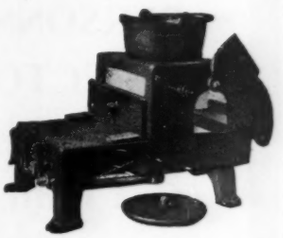
Combination Bench Furnace

Here is one piece of equipment that will seldom lay idle in your shop. The No. 118 is designed for heating the largest soldering coppers, stenciling irons, etc, also for tempering, annealing, case-hardening and soft metal melting. Heating of long rods or sweating joints is made possible by side doors in the hood. A compact, efficient, inexpensive unit.



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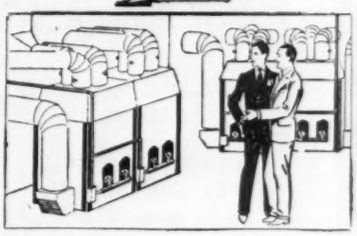

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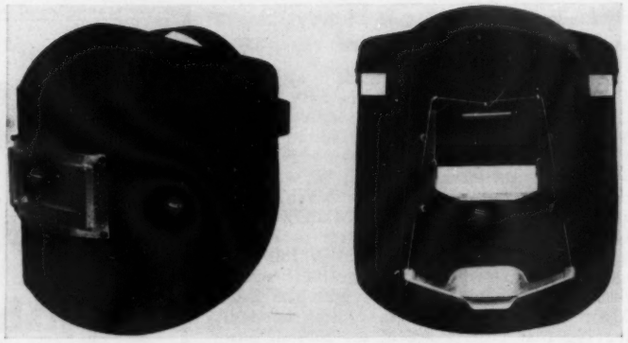
Company name .....

Address .....

AT RIGHT:

Exterior and interior of the Lincoln "Weld-Fast" head shield. Note that protective lens is raised in view at the right.



New Welding Head Shield Announced to Trade

A NEW welding operator's head shield is announced by The Lincoln Electric Co., Cleveland, Ohio. This new type shield, known as the "Weld-Fast" embodies a movable protective lens which allows the operator clear vision without raising the shield.

This shield is an innovation in that the protective lens is held in place in a vertical slide by a spring; slight pressure with the chin on the aluminum rest raises the lens and allows the operator to view the work or change electrodes. When pressure is removed, the lens automatically falls back into place. A stationary cover glass guards the inner lens against spatter and also protects the operator from flying sparks in case the movable lens is accidentally raised.

In order to keep the weight of the shield at a minimum, aluminum is used for the case enclosing the glasses, and featherweight fibre for all other parts.

The sides of the "Weld-Fast" shield are brought well back and close to the head, preventing flashes from other operators. The front curves inward to assist in protecting the chin. An adjustable headband assures the operator of comfort while wearing the shield, and there is sufficient room to allow the operator to wear eye glasses or spectacles without interference.

A. G. A. Laboratory Completes Mixed Gas Research Investigation

The mixed gas research investigation which has included a study of numerous mixtures of natural, manufactured, by-product, and liquefied petroleum gases, involving over 175,000 separate tests and determinations, and extending over a period of five and one-half years, was concluded by the American Gas Association Laboratory in August.

A third and final summary report covering results of tests completed subsequent to the publication of Report No. 645, and giving a summary of the entire investigation, including collateral data developed during this study, has been prepared. After final revision and approval by the Committee on Mixed Gas Research, the report will be presented to the executive board of the Association.

To Complete Reconditioning of Taft-Grapevine Line by Sept. 1.

Completion of Southern California Gas Co.'s reconditioning operations on the 32 mile stretch of 10-inch main line from Taft, Calif. to the Grapevine, was expected by September 1. Stroud Contracting Co., Bakersfield, has the contract, cost of the work being estimated at $125,000.

Files Application for Natural Gas Permit in Idaho Cities

Application has been filed by Alex Wilson of Nampa for permission to serve natural gas in Boise, Nampa and Caldwell, Idaho. Supply for these towns would come from newly developed fields in Owyhee and Canyon counties on the Pickle Butte structure.

Columbia, Mo., on Natural Gas

Missouri Utilities Co., headquartered in St. Louis, changed its Columbia, Mo., system over to natural from manufactured gas recently.

Lateral to Muscatine, Iowa Placed in Service in August

Completion of a 5-mile line from the main line of the Natural Gas Pipe Line Co. of America to Muscatine, Iowa, has been announced, with several industrial customers being served. The H. J. Heinz Co. plant was connected up about August 15, and domestic service was expected to begin as soon as rate schedules could be worked out between the Iowa Electric Co., serving manufactured gas there, and the city commission.

Straight Natural Approved for Several Illinois Cities and Towns

Illinois Commerce Commission has granted Illinois Power and Light Corp. permission to serve straight natural gas with a heat content of 1,000 B.t.u. in Danville, Decatur, Urbana, Champaign, Jacksonville and South Jacksonville. Rate reductions will also go into effect upon change over from mixed natural and manufactured service to straight natural.

Service for Zillah Scheduled by Northwestern Natural Gas Co.

Northwestern Natural Gas Co., Seattle, Wash., plans construction of a distribution system in Zillah, Wash., where a franchise was granted sometime ago. Operating headquarters for the company in the district are maintained at Grandview, Wash., general offices at Seattle, Wash.

San Diego Adds 10,820,000 c. f. Annual Load in June

San Diego Consolidated Gas and Electric Co., San Diego, Calif., reports annual new commercial gas load during June, 1932 of 10,820,000 cubic feet as compared with 4,789,600 cubic feet annual load added in June, 1931. Total gas sales for June, 1932 showed an increase of 12 per cent over sales in June, 1931.

Gas Service Units to Sell Cooling and Air-Conditioning System

Announcement was made early in August that the Gas Service Co., through the Kansas City Gas Co., Kansas City, Mo., and the Wyandotte County Gas Co., Kansas City, Kan., will act as agents for the Carrier Lyle Division of the Carrier Engineering Corp., Newark, N. J. in the sale of a commercial and residence cooling and air conditioning gas system. It is expected that next year the equipment will be available through all units of the Gas Service organization.

Sales will be under the direction of F. M. Rosenkrans, new business manager, Gas Service Co., M. B. Buckley, new business manager, Kansas City Gas Co., and Jack Torbert, new business manager, Wyandotte County Gas Co.

Kansas City Gas Co. has installed a cooling and air conditioning system in its Country Club offices, the work being completed during the first week in August. This installation is being used for demonstration purposes by the company's salesmen.

United Gas Public Service Co. Demolishing Holders at Beaumont

United Gas Public Service Co., headquartered at Houston, is demolishing three large steel gas storage holders and other facilities at the old gas plant on Franklin Street, Beaumont, Texas. Operations are under the direction of A. Morgan, district superintendent with Banks Moreland superintending the workmen. It is estimated that it will take 90 days to clear the site. The holders have not been used since the change-over from manufactured to natural gas in 1925. The largest of the holders has a capacity of 750,000 cubic feet, the second 200,000 cubic feet and the relief holder 100,000 cubic feet.

Four New Holders to Be Built in So. Counties Monrovia District

Southern Counties Gas Co., Los Angeles, Calif., has taken out a permit for construction of additional high pressure holders in the Monrovia District. Four new vertical holders, 87 feet high, will increase the storage capacity of the district from 875,000 to 1,875,000 cubic feet.

Second Line Into Peoria, Ill., Ready to Go Into Service

Central Illinois Light Co., Peoria, Ill., is putting the finishing touches on a second connecting link with the Panhandle Illinois Pipe Line Co.'s Springfield-Peoria extension. The new tie in joins the main line near South Bartonville.

Dudley B. Poling Named Gas Sales Supervisor for Kentucky Utility

Dudley B. Poling has been appointed to the position of gas sales supervisor for the Kentucky-Tennessee Light and Power Co., Bowling Green, Ky., replacing Walter H. Hoagland, according to M. M. McKinney, new business manager for the company.

To Extend Service to French Camp

Pacific Gas and Electric Co., San Francisco, Calif., is planning to extend gas service to French Camp, south of Stockton, Calif. Fifty seven applicants have signed for service in the new section.

Asks Franchise to Serve Fayette

Central States Gas Utilities Co., Kansas City, Mo., has applied for a franchise to serve Fayette, Mo., with natural gas from the main pipe line of the Panhandle Eastern Pipe Line Co., also headquartered in Kansas City.

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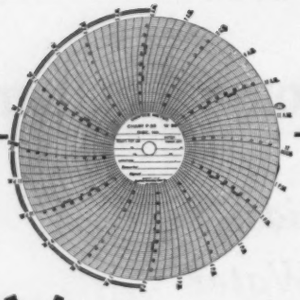

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Apartments from $75 a Month
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Modern, Home-like and Supremely Comfortable

LOS ANGELES

Hicks to Manage for Union Public Service Co. at Ottawa, Kan.

H. S. Hicks, who has been manager of the Union Public Service Co. properties in the Beloit, Kan., district with headquarters at Beloit, has been named acting manager for the company at Ottawa, Kan. Union Public Service is a Gas Service Co. subsidiary. J. W. King, veteran manager of Union Public Service at Ottawa, has been granted an extended leave of absence to recuperate from a recent illness. Jess. G. Adams will take Mr. Hicks' place at Beloit.

Mr. Hicks has served with Doherty companies for several years, and was new business representative of Union Public Service Co. at Merriam, Kan., before being made manager of the Beloit division.

P. G. and E. to Extend Service to U. S. Army Air Base

Pacific Gas and Electric Co., San Francisco, Calif., will start work immediately on a half mile extension to serve natural gas to the U. S. Army at Hamilton Field Air Base in Marin County, Calif. The army will install and own the distribution mains and services including the gas meters and regulators at the various buildings on the field. Contract for construction of the distribution system has been let to P. L. Burr of San Francisco by the army.

Line Under Way to Serve Morrell Packing Plant at Sioux Falls

Work was begun recently on a 10-inch extension from the main line of the Northern Gas and Pipe Line Co. at Sioux Falls, S. D., to serve the John Morrell & Co. packing plant with natural gas. Cost of the project is estimated at $60,000, the work to be completed the latter part of September. Sioux Falls Gas Co. is constructing the line.

Complete Line to Taylorville, Ill., Change Over to Natural

Central Illinois Public Service Co. recently changed over its system at Taylorville, Ill., from manufactured to natural gas. The turn-on inaugurated a change-over program in the district, following completion of a line from the Panhandle Illinois Pipe Line Co.'s main line by Vincent Construction Co. of Kansas City, Mo.

Additional Supply for Brady, Texas Assured by Line Construction

Empire Southern Gas Co., with Texas headquarters in Denton, recently completed laying 5 miles of new gas main at Brady, Texas, replacing 4-inch pipe with 8-inch, and giving Brady additional supply of natural gas. Repairs and reconditioning of the metering station were also completed about August 15.

Replace Main Line of Montana-Dakota Power Co. Near Belle Fourche

Montana Dakota Power Co. recently completed replacing a short stretch of main gas line north of the town of Minnesela, three miles of Belle Fourche, S. D. The work was done under the direction of George Rawie of Baker, Mont., pipe line superintendent for the company.

Pacific Gas and Electric Co. to Improve Grass Valley Plant

Pacific Gas and Electric Co., San Francisco, Calif., has approved an expenditure of $25,000 for new generating and auxiliary equipment in its gas manufacturing plant at Grass Valley, Calif.

Grays Harbor Gas Prospects Looking Up; 1,000,000 c. f. Well

A gas well, estimated to be flowing about 1,000,000 cubic feet daily, was brought in recently in the Grays Harbor area in Washington. The Shippey-Henderson interests of Kansas brought in the well. The gas is estimated to have between 900 and 1,000 B.t.u. content.

Among companies reported to be active in gas drilling programs in Washington are the Cities Service Co., Texas Co., Superior Oil Co., Union Oil Co., and the Ohio Oil Co.

Clinton Gas and Distributing Co. Now Holds Cameron Franchise

Cameron, Mo., probably will have natural gas service some time this year by the Clinton Gas and Distributing Co., present holder of the Cameron franchise, assigned to the company by C. D. Reynolds, original grantee. The company is reported to be planning construction of a short pipe line from gas fields near the town.

Producers Natural Gas Co., Ltd., Incorporated at Vancouver, B. C.

Producers Natural Gas Co., Ltd., is the name of a newly incorporated company with offices at 316 Hall Building, West Pender St., Vancouver, B. C. The company's papers describe it as distributor and manufacturer of natural and manufactured gas and allied products.

P. G. and E. Employees Placed on Five-Day Working Schedule

Effective September 1, 1932, and continuing until further notice, employees of the Pacific Gas and Electric Co., who have not heretofore been placed on a reduced working time basis, will be placed on a five-day week basis. This reduction in working time will carry with it a reduction in compensation.

Jenkins Transferred to Newton, Kan. Jones Goes to Wichita Gas Co.

John O. Jenkins, chief clerk of the Bartlesville Gas and Electric Co., Bartlesville, Okla., has been made chief clerk of the Newton Gas Co., Newton, Iowa. Earl Jones, who has been with the Newton office, has been transferred back to the Wichita Gas Co., Wichita, Kan.

Rocky Mountain Gas Co. To Enlarge Its Craig, Colo., Offices

Rocky Mountain Gas Co., subsidiary of Ohio Oil Co., Casper, Wyo., has purchased the Craig National Bank Building, in Craig, Colo. and plans to enlarge its offices and make extensive repairs. John McFayden is president of the company.

Thorsen Applies for Franchise to Serve Natural Gas in Ontario

George Thorsen has applied for a franchise to serve natural gas in Ontario, Ore., supply to come from a newly developed field near the town, reported to be producing about 5,000,000 cubic feet daily. An active drilling program is under way in the field.

Natural for Chowchilla, Calif.

San Joaquin Light & Power Corp., Fresno, Calif., has applied for franchise to serve natural gas in Chowchilla, Calif. The town is in the Madera district of the company.

V-port VALVE CF Vigilant

FOR quiet operation at all times when demands are fluctuating, for sure and exact regulation under light loads as well as heavy, a Vigilant Liquid Level Regulator with V-port Valve is recommended. Wide-open, it has a capacity equal to that of the pipe. When flow is at minimum, the distance between valve and seat is still enough to assure free action.

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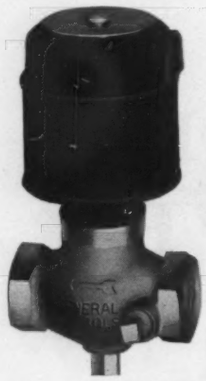

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Distribution and operation natural gas man, age 28, married, desires position. Eight years experience in installing and operating town plants. Can build industrial and house heating loads and handle public relations. Have had responsible position as district manager. Moderate salary. Excellent references. Address Box E-213, *Western Gas,* 124 West Fourth Street, Los Angeles, Calif.

Wanted—Position as fitter. Applicant has had 12 years experience, is 32 years of age, married. Would prefer to locate in or near South Carolina, but will consider position anywhere. Address Box E-215, *Western Gas,* 124 West Fourth Street, Los Angeles, Calif.

Position Wanted—Experienced gas maker and plant operator. Understands the installation of gas machinery and pipe work. Can supervise men or will work as subordinate. Excellent recommendations. Address Box E-217, *Western Gas,* 124 West Fourth Street, Los Angeles, Calif.

Manager-engineer, broad experience covering operation and maintenance, also supervision of construction of distribution systems. Have been succeeded by a man who is my senior in service. Good references. Married, healthy, age 35. Will go anywhere for a permanent situation. Address Box E-219, *Western Gas,* 124 West Fourth Street, Los Angeles, Calif.

Married man, age 25, desires position in engineering department, location immaterial. Applicant is experienced in sales, domestic and industrial work, and is familiar with butane plant construction and operation. Education, full experience and references furnished. Desire start at bottom, at your salary. Address Box E-221, *Western Gas,* 124 West Fourth Street, Los Angeles, Calif.

Moves Memphis, Texas, Office

Northern Texas Utilities Co., Memphis, Texas, moved into new offices early in August. The company headquarters in Wichita Falls.

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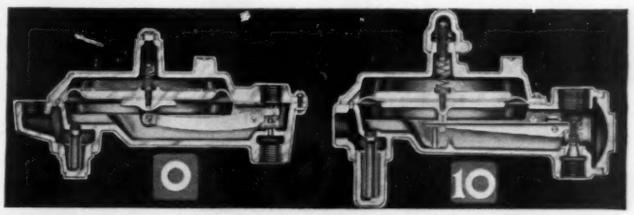

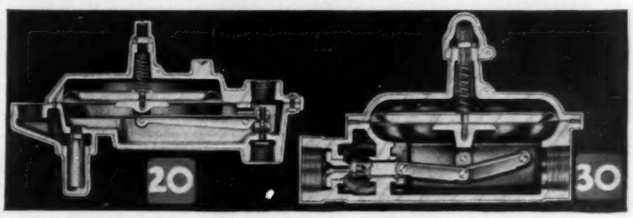

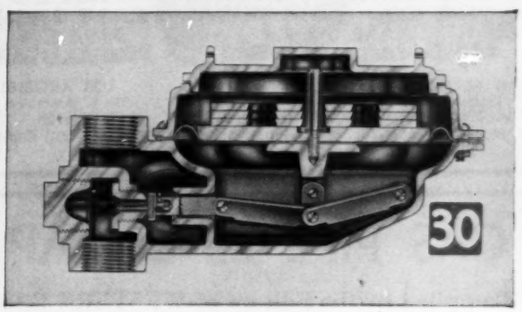

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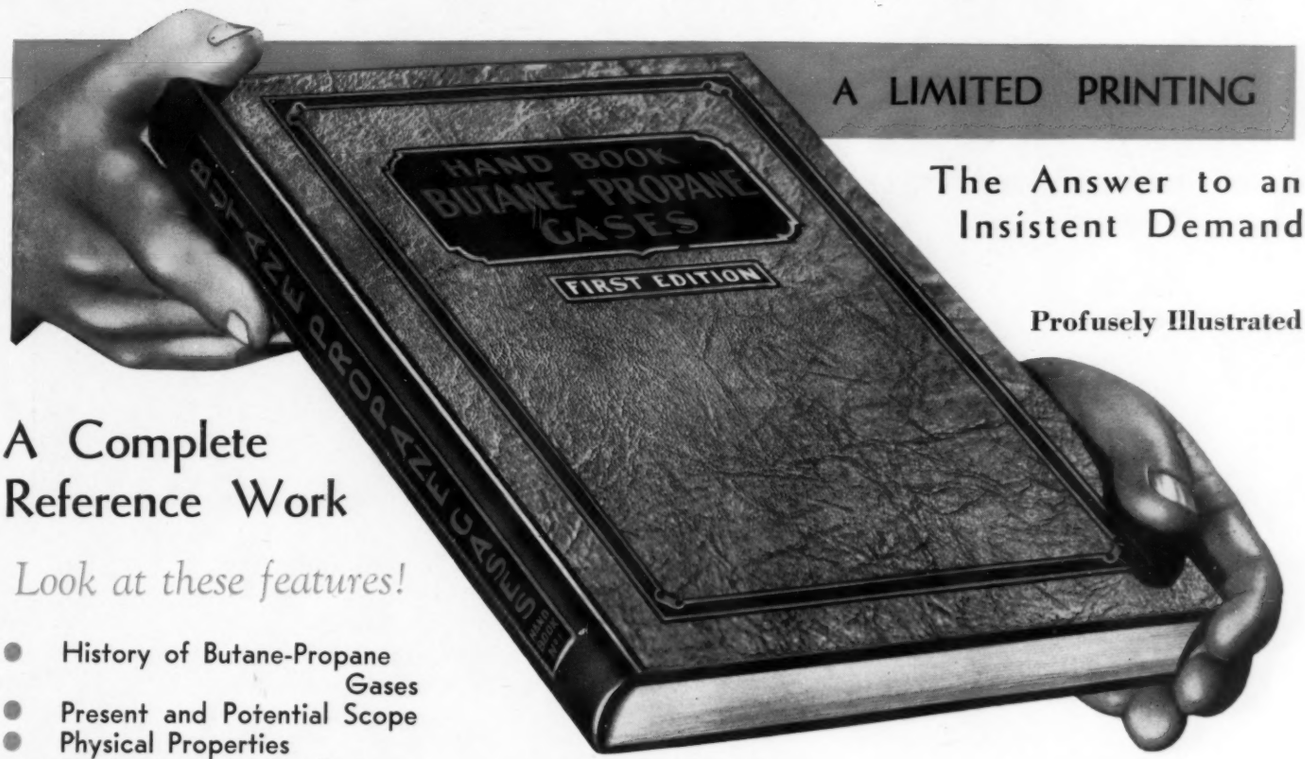

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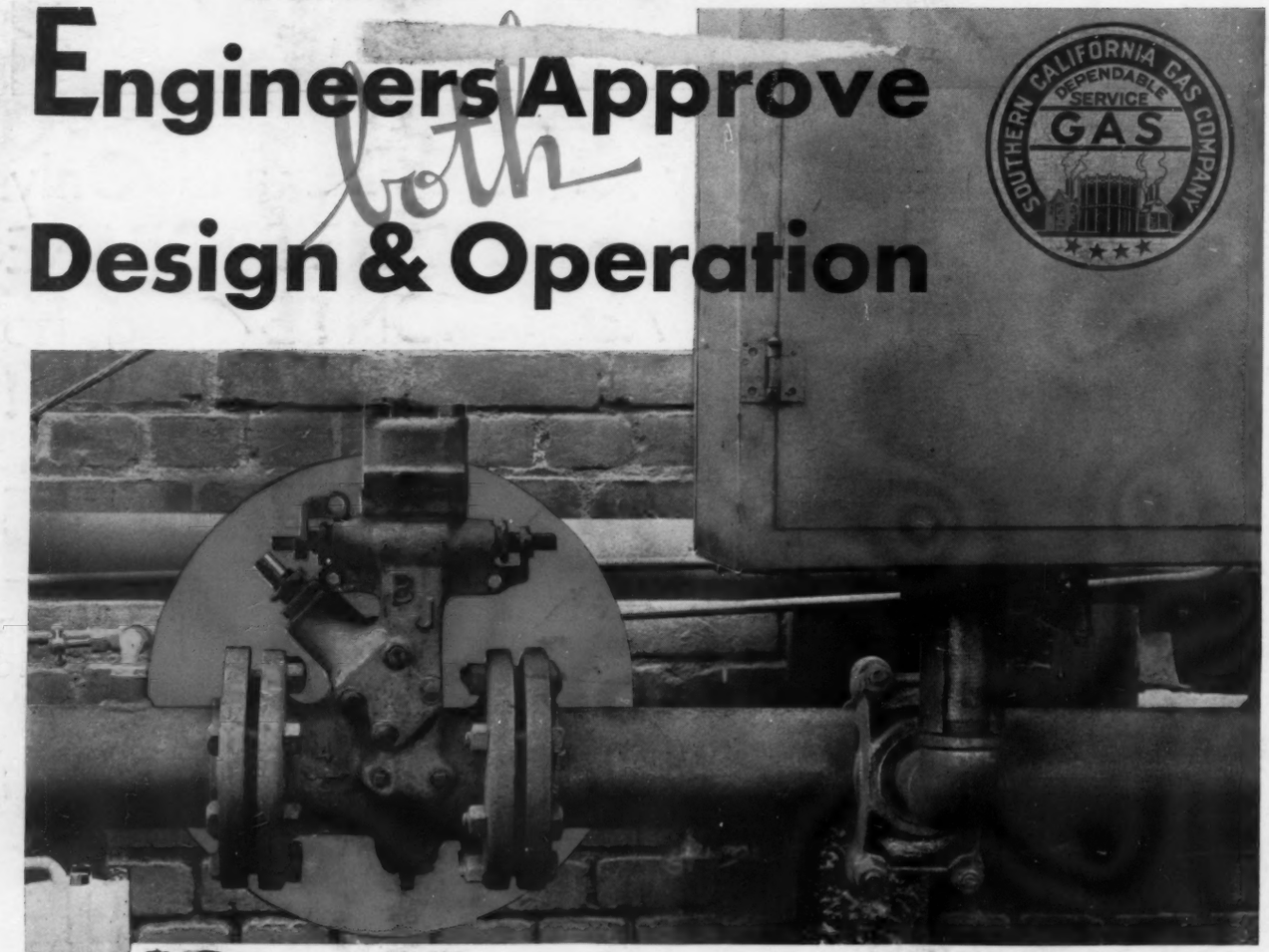

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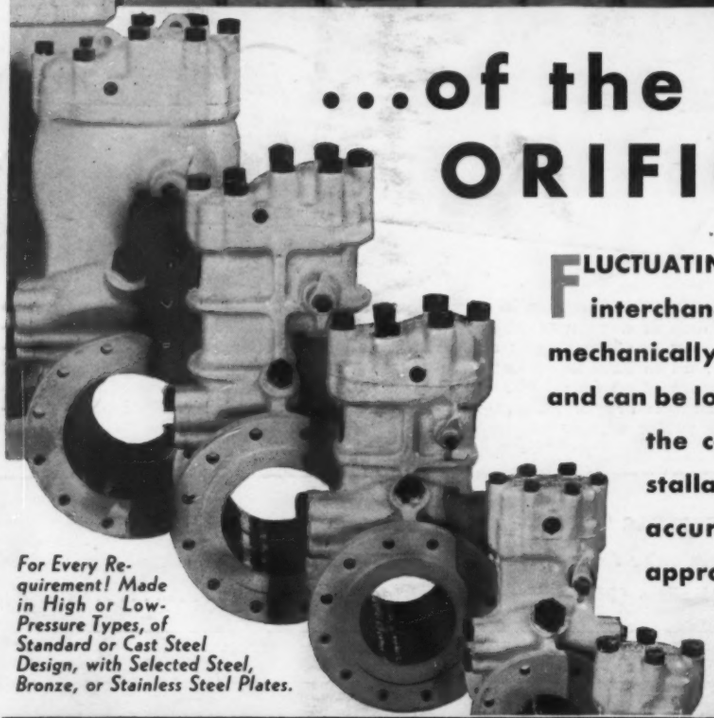

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